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OCTOBER 1961

Volume 30 Number 10

The International Journal of Medicine in Industry

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1. Barden, F. W., et al.: J. Maine M. A. 46:99, 1955.
2. Ford, R. A., and Blanchard, K.: Journal-Lancet 78:185, 1958.

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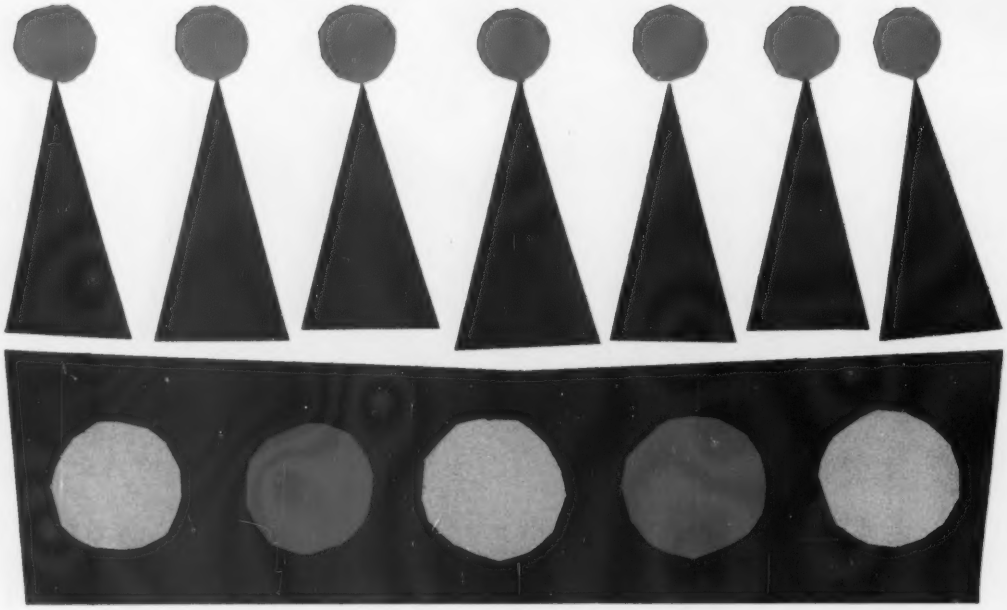

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ESTABLISHED 1932

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PERSONAL NEWS AND NOTES

LOGAN T. ROBERTSON, M.D., Occupational Health Consultant of Asheville, N. C., has been named Medical Consultant to the President of the New York State Civil Service Commission.

DR. ROBERTSON has been assigned the task of developing policies and activation schedules for an occupational health program to serve the 100,000 employees of the New York State Government.

Second Conference on Rheumatic Diseases in Industry, jointly sponsored by the Arthritis and Rheumatism Foundation (National Headquarters and New York Chapter), the New York State Society of Industrial Medicine, Inc., and the Institute of Industrial Medicine of the New York University Medical Center, will be held on November 2, 1961, in the Medical Sciences Building of the NYU School of Medicine in New York City.

All physicians and medical students are cordially invited to attend.

ALBERT O. RYAN, JR., M.D., has been appointed Assistant Medical Director for Olin Mathieson Chemical Corporation's operations at Pisgah Forest, North Carolina.

Prior to joining Olin, DR. RYAN was engaged in private practice, and had served as Director of the Polk County (Florida) Health Department.

W. O. ARMSTRONG, M.D., of Ponca City, Texas, retired on September 30 as Medical Director for Continental Oil Company. A pioneer in the field of occupational and preventive medicine, he organized Continental's medical program and has been the Medical Director for 32 years.

DR. ARMSTRONG served in the Medical Corps during World War I and received his medical degree in 1924 from the University of Oklahoma School of Medicine.

He is a member of the American Medical Association, a Fellow of the Industrial Medical Association, and a member of the American Academy of Occupational Medicine, American Industrial Hygiene Association, and Texas Industrial Medical Association.

CLARENCE LEE LLOYD, M.D., President, announces that the Western Industrial Medical Association, Inc. is sponsoring the Fifth Annual Western Industrial Health Conference at the Biltmore Hotel in Los Angeles, October 6 and 7, 1961.

JEAN S. FELTON, M.D., Chairman of the Program Committee, has arranged a program to cover subjects of interest to the nurse, safety engineer, hygienist, and health physicist as well as the industrial physician, including legal aspects, the cost and value of a medical program, and the preplacement physical examination in industry.

P. K. GHOSH, M.B., D.T.M., Editor of the *Indian Journal of Industrial Medicine* in Calcutta, has been appointed to the Overseas Staff of *Industrial Medicine and Surgery*. DR. GHOSH will replace H. P. DASTUR, M.D., of Bombay, who will retire. DR. DASTUR was Chief Industrial Health Officer for Tata Services, Ltd. of Bombay until he retired in 1959, and he is Chairman of the Executive Council of Industrial Safety of Bombay.

DR. GHOSH is also Professor of Medicine at R. G. Kar Medical College, University of Calcutta; Chief Medical Officer for Chloride and Exide Batteries in India; Medical Consultant to the Bata Shoe Works in Calcutta; and Lecturer in Industrial Hygiene at the University of Calcutta. He is a past president of the All India Society for Study of Industrial Medicine, and he was a participant at the Eleventh and the Thirteenth International Congresses on Occupational Health, and at the Second and Third Asian Conferences on Occupational Health.

DR. GHOSH is the author of numerous papers on occupational health and industrial hazards in various medical journals. He is a Fellow of the American College of Chest Physicians, a Member of the Royal College of Physicians, London, and a Fellow of the Royal College of Physicians, Edinburgh.

The U. S. Atomic Energy Commission has announced the establishment of special fellowships in Industrial Medicine to begin in the 1962-1963 academic year under the administration of the Atomic Energy Project, School of Medicine and Dentistry, University of Rochester. The fellowships will provide advanced training in the field of Industrial Medicine, particularly in relation to the atomic energy industry. The selection of Fellows will be made by the A.E.C. and, for the academic year 1962-1963, eight Fellowships will be available.

The Fellowships are open to citizens of the United States who have graduated from an approved college of medicine, and who have completed at least one year of internship and are licensed to practice medicine in one of the states or territories of the United States.

The recommended program, designed to satisfy specialty board requirements in Occupational Medicine consists of two parts: an academic phase of two years with lecture and laboratory instruction, to be taken at a university offering an approved graduate course in Occupational Medicine that can provide special training facilities in the health problems associated with the Atomic Energy Program; and an

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in-plant or field training year in one or more of the medical departments of the major operating plants and laboratories under the direction of the Atomic Energy Commission, or in the medical programs of other industries and organizations approved for such training.

Fellowships for the academic year 1962-1963 should be filed before January 1, 1962, and it is expected that selection of Fellows will be made on or before February 1. The stipend for each of the academic years is $5000, and additional allowance of $350 will be added for a wife and for each dependent child. Tuition, laboratory fees, and certain other incidental expenses will also be paid. During the in-plant year the stipend is paid by the organization providing training, and a minimum of $7500 is recommended.

Address inquiries to: A.E.C. Fellowships in Industrial Medicine, Atomic Energy Project, University of Rochester School of Medicine and Dentistry, Rochester 20, New York; Attention: Dr. Henry A. Blair.

Surgeon General LUTHER L. TERRY of the Public Health Service has announced the reassignment of JAMES K. SHAFER, M.D., M.P.H., to the Office of Civil and Defense Mobilization, where he will serve as Director of Health Services. He succeeds W. PALMER DEARING, M.D., who retired on August 31 to become the first Executive Director of the Group Health Association of America.

DR. SHAFER will assist the OCDM director in the development of policies for allocating and utilizing health resources, in supplying professional guidance to Federal agencies in health mobilization planning, and in maintaining liaison with the Nation's health professions and institutions. He will also serve as U. S. member of the NATO Medical Committee.

DR. SHAFER has served with the Public Health Service since his graduation in 1938 from the University of Nebraska Medical School. He received the master's degree in public health from Johns Hopkins University in 1943. He has served in a number of clinical and public health assignments, and has been Chief of the Division of Community Health Practice since 1957.

S. D. STEINER, M.D., Corporation Medical Director, General Motors Corporation, has been appointed to the Medical Advisory Council of the American Association of Industrial Nurses. The Medical Advisory Council, on which DR. STEINER will serve, is composed of leading industrial physicians and counsels with the nursing group on matters relating to the industrial medical and nursing professions.

Among other professional affiliations, DR. STEINER is a member of the American Academy of Occupational Medicine, Industrial Medical Association, Industrial Hygiene Foundation of America, Michigan Industrial Medical Association, and The President's Committee on Employment of the Physically Handicapped.

The following physicians, who have been serving on the Medical Advisory Council, have been reappointed:

GLENN S. EVERTS, M.D., Medical Director, The Curtis Publishing Company, Philadelphia;

JAMES P. HUGHES, M.D., Medical Director, Kaiser Aluminum & Chemical Corporation, Oakland, California;

WILLIAM L. MACON, JR., M.D., Director of the W. L. Macon Medical Center of St. Louis;

O. TOD MALLERY, JR., M.D., Medical Director of the Employers Mutuals of Wausau, Wisconsin; and

RICHARD C. SWAN, M.D., Medical Director, Delco-Remy, General Motors Corporation, Anderson, Indiana.

New York University's College of Engineering has formed a Biomedical Computing Section within its Research Division to provide computer services for medical researchers. It is believed to be the first such facility to be established by a university.

The Research Division has received an initial $48,000 grant from the National Institutes of Health for support of the new unit. As its joint directors, the College has designated DR. MAX A. WOODBURY, Research Professor of Mathematics, and DR. LEE D. CADY, JR., Assistant Professor of Physical Medicine and Rehabilitation at NYU's School of Medicine.

In announcing the formation of the new laboratory, DR. WOODBURY observed that "medicine is lagging 10 years behind the physical science in this field. A

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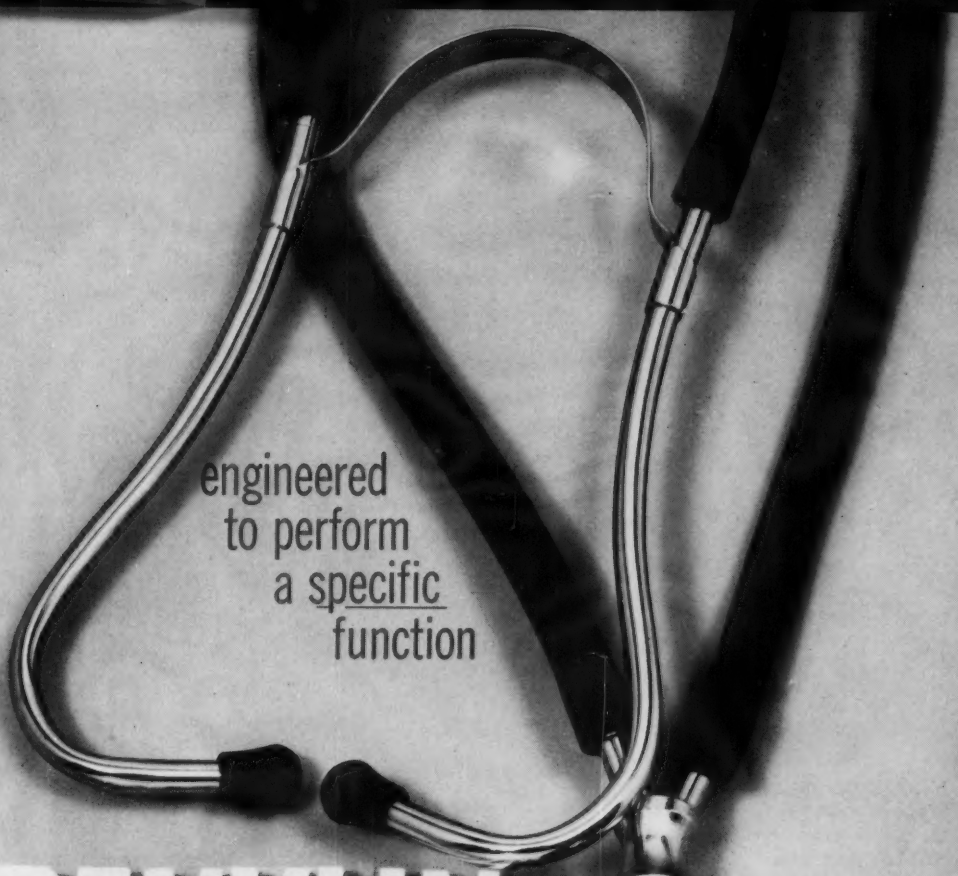

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A long-range goal of the Engineering Research Division is to develop a highly automated computing center for the processing of medical data on a large scale. Its staff already has carried out a considerable amount of research on the application of computers to medical data analysis.

The computation laboratory, which operates an IBM 650 computer and data processing equipment, will shortly install a new and much larger CDC 1604 computer. The laboratory is located at 233 Fordham Landing Road, near NYU's University Heights campus in the Bronx.

Publication of the third edition of the annual directory and bibliography of the National Institutes of Health has been announced by the Public Health Service.

The publication is intended for reference use by research workers in the biomedical sciences inside and outside the Federal Government. It presents the broad outlines of NIH structure, names the professional staff, and lists more than 1600 scientific and technical papers deriving from the NIH program of direct reseach — laboratory and clinical — during 1960. This number represents a 70% increase in published papers since 1956.

Designed to increase the usefulness of the volume are two indexes: one lists staff members and authors; the other is a subject index that reflects the scope of NIH research and provides quick reference to major and subordinate research areas. These areas covered the vast extent of problems that concern biomedical scientists — from the biochemistry within the human cell to the causes and control of the degenerative diseases, and the physiological and psychological aspects of aging.

Copies of the publication are available from the Public Information Section, Office of Research Information, National Institutes of Health, Bethesda, Md.

The New York Academy of Medicine inaugurated its newly formed Section on Occupational Medicine at a dinner meeting held in the Academy building on September 27th. The after-dinner address was presented by JAMES H. STERNER, M.D., Medical Director of Eastman Kodak Company and President of the National Health Council. DR. STERNER spoke on "The Occupational Physician and the Community."

NORMAN PLUMMER, M.D., and DAVID H. GOLDSTEIN, M.D., are Chairman and Secretary pro tem respectively of the Section. This Section was formed at the request of a group of Fellows of the Academy who are particularly interested in this field, and was approved by vote of the Fellows of the Academy and the Academy Council.

The Academy now has Sections on the major branches of scientific and clinical medicine and a Section on Historical Medicine.

THEODORE F. HATCH, M.S., internationally known educator and industrial hygienist, has been appointed to the Advisory Committee to the Surgeon General on Occupational Health. Professor of Industrial Health Engineering at the Graduate School of Public Health, University of Pittsburgh, since 1949, MR. HATCH has been a central figure in the development of the field of industrial hygiene. His earlier responsibilities have included directing research for the Industrial Hygiene Foundation as well as teaching and serving with state health and labor departments.

MR. HATCH has published more than 100 articles on various aspects of industrial hygiene, and he is co-author of the widely used textbook, *Industrial Dust*.

The committee to which MR. HATCH has been named meets at least once a year to advise on needs and Public Health Service activities in the field of occupational health. Members of the committee are selected from industrial management, organized labor, state health and labor departments, and the professions in occupational health.

EDWARD P. LUONGO, M.D., Associate Clinical Professor of Preventive Medicine and Public Health, and Medicine — Industrial Medicine, at the University of California School of Medicine; and Regional Medical Director, Mobil Oil Company, Los Angeles, is teaching a course at the University in Los Angeles, entitled "Principles and Theory in Occupational Health." The course is offered by the University of California, Los Angeles, through the Continuing Education in Medicine and Health Sciences Division of the University Extension, and was designed for physicians, nurses, and others engaged in or connected with the practice of medicine in industry, full or part-time. The course meets on Wednesday evenings throughout the fall academic term, September 20 to January 31, 1962.

Five new positions have recently been filled as the Division of Occupational Health, Public Health Service, U. S. Department of Health, Education, and Welfare, continues to expand and strengthen its program of worker health protection. WILLIAM A. McQUARY, M.S., GORDON S. SIEGEL, M.D., M.P.H., and MARY LOUISE BROWN, R.N., M.S., have joined the State Services Branch; and MRS. MABELLE J. MARKEE, R.N., M.P.H., has transferred to the Employee Health Programs Section. PHILIP E. ENTERLINE, Ph.D., has been appointed to the office of the Division chief.

MR. McQUARY, who has served in the field of public health since 1934, has been named chief of the State Aid Section. In this capacity he will provide professional consultation on the development and operation of state and local occupational health programs. His section will act as a focal point in the assignment of Public Health Service consultants to states and regions as they are needed and in making available to the states grants for special studies and problems. MR. McQUARY was first associated with

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the Public Health Service in 1941 when he joined the Division of Industrial Hygiene. In his latest assignment, he was Chief Public Health Advisor of the United States Operation Mission and Director of the Inter-American Cooperative Health Services in La Paz, Bolivia. MR. MCQUARY has a master's degree in sanitary engineering from Johns Hopkins University.

DR. SIEGEL has succeeded THOMAS K. CALLISTER, M.D., as Chief of the Employee Health Programs Section. This section will develop and recommend, in cooperation with appropriate professional organizations, industrial medical policies, standards, and procedures. Attention also will be given to the place of the discipline of occupational medicine in medical education. DR. SIEGEL joined the Public Health Service as an intern in 1954 after receiving his medical degree from the University of Chicago. He later was chief of the Federal Employee Health Service, Denver Federal Center. DR. SIEGEL has served a residency in internal medicine in Boston and a residency with the New York State Health Department. Prior to joining the Division of Occupational Health he received his master of public health degree from the Harvard School of Public Health.

MISS MARY LOUISE BROWN has joined the Division as Chief of the Occupational Nursing Section. Her activities will include the development of research programs in occupational health nursing and cooperation with universities and professional organizations in strengthening teaching programs in the field. She also will be concerned with ascertaining occupational health nursing needs and in planning with regional, state, and local agencies on how these can be met. MISS BROWN has had industrial nursing experience with the United States Steel Corporation and more recently served as Assistant Professor of Public Health (Occupational Health Nursing) at the Yale University Medical School. A graduate of the West Pennsylvania School of Nursing, MISS BROWN received from the University of Pittsburgh a bachelor's degree in nursing education and a master's degree with a major in mental health nursing.

MRS. MABELLE J. MARKEE, who has been Chief of Occupational Nursing since 1956, is joining DR. SIEGEL in the Employee Health Programs Section. In this new position, MRS. MARKEE will be concerned with trends in employee health programs and with special studies and research activities in this field. Experienced in both industrial and public health nursing, MRS. MARKEE joined the Public Health Service in 1945 as a commissioned officer. She is a graduate of the University of Nebraska School of Nursing and holds a master's degree in public health from the University of Michigan.

DR. ENTERLINE, as Chief of Biometrics and Social Studies, will be an advisor to the Division Chief for the design and evaluation of research projects concerning occupational health. He will have particular responsibility for the promotion of studies which emphasize the effect of sociologic and psychologic factors on the health and productivity of the working population. DR. ENTERLINE joined the Public Health Service as a statistician in 1946, and his latest assignment was Chief of the Morbidity and Health Statistics Branch, Division of Public Health Methods. DR. ENTERLINE has degrees in economics and statistics, and a doctorate in sociology from the American University.

Died

NELSON K. BENTON, M.D., 77, on April 19, 1961, Portland, Maine. A graduate of Columbia University College of Physicians and Surgeons in New York City (1909), DR. BENTON was a member of the Industrial Medical Association, and formerly was Medical Director of Western Union Telegraph Company.

FRANK L. FISHER, M.D., 63, Crawfordsville, Ind., on April 26, 1961. DR. FISHER was Medical Director of the R. R. Donnelly and Sons Co. in Crawfordsville. He graduated from the McGill University Faculty of Medicine in Montreal in 1924, and he was a member of the Industrial Medical Association.

ONIS H. HORRALL, M.D., 72, of Chicago, on April 1, 1961. For many years a chief surgeon for the Chicago, Burlington and Quincy Railroad and the American Bus Lines, DR. HORRALL graduated from Rush Medical College in Chicago in 1920.

AARON SAMUEL LEVEN, M.D., DR. P. H., 64, Los Angeles, on August 23, 1961. A member of the Industrial Medical Association and a pioneer in this field, DR. LEVEN practiced in Chicago for 25 years, and, during the 16 years prior to his death, in Los Angeles.

DR. LEVEN graduated from the Kansas City College of Medicine and Surgery in 1919. He was a commissioned medical officer during both World Wars, and he received a Presidential Citation for his work in the Administration of the Selective Service System.

MAX M. VAN SANDT, M.D., 57, Washington, D. C., on April 22, 1961. DR. VAN SANDT was Medical Director of the U. S. Public Health Service. He graduated from the University of Cincinnati College of Medicine in 1930, and joined the Public Health Service in 1938. One of his last assignments was liaison medical officer, special projects branch, of the Public Health Service, in which post he was Medical Director to the Atomic Energy Commission-Maritime Administration for N/S Savannah program and the emergency operations program of the special projects branch, division of radiological health. DR. VAN SANDT in 1960 received the Pfizer Award of Merit for meritorious service to the people of the United States and the medical health professions.

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Minimizes Hazard of Drowsiness on the Job

as compared with other preparations containing antihistamines

DRISTAN Decongestant Tablets afford *a new degree* of symptomatic relief from sinus congestion, allergic disorders and the common cold. DRISTAN is a special 3-layer tablet development which offers a combination of ingredients never before possible to put into a single tablet releasing:

No Capsule, Single-Layer or Sugar-Coated Tablet Can Duplicate Dristan's Exclusive 3-Layer Tablet Formula.

1. PHENYLEPHRINE HYDROCHLORIDE, a vasoconstrictor to shrink swollen sinus membranes and promote drainage.
2. PHENINDAMINE TARTRATE, a unique antihistamine to control edema and discharge caused by offending allergens. Rarely produces drowsiness.

   Approved APC FORMULA to reduce fever and body aches.
3. VITAMIN C to build up body resistance to colds infection.

CONVENIENT SANITARY DISPENSER

This Dristan Dispenser contains 50 envelopes of 2 DRISTAN Tablets each. Designed especially for industrial medical use. Economically priced. Available through your regular supplier.

WHITEHALL LABORATORIES
NEW YORK 16, N.Y.

VALUE

TOPICAL STEROID NEWS: BREAKTHROUGH IN THERAPY

In steroid responsive dermatoses you may prescribe new Panzalone Cream for rapid healing without concern about side effects and cost-to-patient, even when used on extensive areas for prolonged periods.

2% CREAM

PANZALONE™

delta-5-hemisuccinoxypregnenolone*, DOAK

PRICE

BREAKTHROUGH IN THERAPY

because the 2% concentration of Panzalone Cream helps assure quick relief of symptoms and more rapid healing of lesions,

because Panzalone is a new and fundamentally different steroid for topical application; it is non-corticoid and thus cannot produce corticoid side effects and

because cost-to-patient of an Rx for Panzalone Cream, reflecting the economies in synthesis of this new steroid, will be less than ½ the average for comparable topical steroid creams.

Panzalone Cream is applied 3-4 times a day, supplied as 15 Gram (½ oz.) tubes. Each gram of water washable cream contains 20 mg. of delta-5-hemisuccinoxypregnenolone (Δ^5-pregnen-3(β)-hemisuccinoxy-20-one), DOAK with Buro-Sol®, DOAK (equivalent to 3.38 mg. aluminum acetate), pH 5.5. Distributed in Canada by Trans-Canada Pharmacal Co., Montreal, P. Q.

*PATENT PENDING

DOAK Pharmacal Co., Inc., New York 16, N.Y.

What now?

Chymar,® for one thing

SUPERIOR SYSTEMIC ANTI-INFLAMMATORY ENZYME

to control inflammation, swelling and pain in SURGICAL TRAUMA, fractures and traumatic injuries. Reaction of tissue to surgical procedures and acute trauma delays healing through inflammation, edema and retarded absorption of blood extravasates. Timely use of Chymar minimizes these reactions—edema subsides, inflammation is suppressed, and absorption of extravasates is expedited. In the treatment of wounds, Chymar effected relief of pain, decrease in edema, and absorption of hematoma in 90% or more of patients.[1] In a study of 491 surgical cases, it was frequently observed that "postoperative wound 'hardness' had disappeared in 10-14 days."[2] In cosmetic surgery, results with supportive Chymar "were remarkable."[3] And in traumatic injuries Chymar has consistently relieved pain and swelling, speeded healing of damaged tissue.[4]

the systemic route to faster healing at any location

1. Morani, A. D.: J. Med. Women's Fed. *42*:12, 1960. 2. Cigarroa, L. G.: J. Internat. Coll. Surgeons *34*:442, 1960. 3. Moore, F. T.: Brit. J. Plastic Surg. *11*:335, 1959. 4. Personal Communications to the Medical Department, Armour Pharmaceutical Company, 1959.

ARMOUR PHARMACEUTICAL COMPANY
KANKAKEE, ILLINOIS • *Originators of Listica®*

CHYMAR

Chymar Aqueous and Chymar (in oil) contain crystallized chymotrypsin, a proteolytic enzyme with systemic anti-inflammatory properties. Each cc. of Chymar contains 5000 Armour Units of chymotrypsin, 0.18% methyl paraben, 0.02% propyl paraben, 2% aluminum monostearate, q.s. sesame oil. Each cc. of Chymar Aqueous contains 5000 Armour Units of chymotrypsin, 0.9% sodium chloride, 0.2% calcium acetate, 0.01% thimerosal, q.s. Water for Injection. ACTION: Reduces inflammation of all types; reduces and prevents edema except that of cardiac or renal origin; hastens absorption of blood and lymph extravasates; helps to liquefy thick tenacious mucous secretions; restores local circulation, promotes healing; reduces pain. INDICATIONS: Chymar is indicated in respiratory conditions such as asthma, bronchitis, sinusitis and rhinitis; in accidental trauma to speed reduction of hematomas, bruises and contusions; in inflammatory dermatoses to ameliorate acute inflammation in conjunction with standard therapies; in gynecologic conditions therapeutically or in conjunction with antibiotics in pelvic inflammatory disease; in surgical procedures as biopsies, G.I. surgery, hernia repairs, hemorrhoidectomies, plastic surgery and thrombophlebitis; in peptic ulcers and ulcerative colitis as an adjunct to diet, antispasmodics, antacids, etc.; in genitourinary disorders as epididymitis, orchitis and prostatitis; in eye conditions as acute conjunctivitis, traumatic edema, hematomas, and eye surgery; in dental and oral surgery as fractures of the mandible or maxilla, alveolectomies, denture fitting, and multiple extractions; and in obstetrics as in episiotomies, breast engorgement, and thrombophlebitis. PRECAUTIONS: Chymar and Chymar Aqueous are for intramuscular injection only. Although sensitivity to chymotrypsin is uncommon, reactions to anti-inflammatory enzymes have been observed. The usual remedial agents (epinephrine, corticotropin (HP* ACTHAR Gel), antihistamine, aminophylline, etc.) should be readily available in case of untoward reactions. Precautions (scratch testing for Chymar (in oil), scratch or intradermal testing for Chymar Aqueous) should be exercised in those patients with known or suspected allergies or sensitivities. As with any foreign protein, patients may develop sensitivity from repeated injections. It is, therefore, recommended that the above precautions be considered prior to administration. In further treatment of those patients in whom a previous injection of chymotrypsin produced signs of possible sensitivity, such as localized edema and erythema at injection site, urticaria, conjunctivitis, etc., particular care must be exercised. INCOMPATIBILITIES: With usual agents, none known—e.g., compatible with antibiotics and anesthetics. DOSAGE: 0.5 cc. to 1.0 cc. deep intramuscularly once or twice daily, depending on severity of condition. Decrease frequency as course of condition is altered. In chronic or recurrent conditions, 0.5 cc. to 1.0 cc. once or twice weekly. SUPPLIED: Chymar in Oil 5 cc. vials and Chymar Aqueous 1 and 5 cc. vials; 5000 Armour Units of proteolytic activity per cc. *Highly Purified.

Everyday practice report:

Following initial clinical investigational work, Forhistal was sent to physicians throughout the country for evaluation as an antiallergic and antipruritic agent in everyday practice. Results in 6181 cases have now been analyzed. In 3419 cases in which a comparison was made, Forhistal was judged better than previous therapy in 7 out of 10 patients. Information about the investigational work done previously is being mailed to you separately and is also available on request.

SUPPLIED: *Tablets*, 1 mg. (pale orange, scored), *Lontabs*, 2.5 mg. (orange). *Syrup* (pink), containing 1 mg. Forhistal maleate per 5-ml. teaspoon. *Pediatric Drops* (pink), containing 0.5 mg. Forhistal maleate per 0.6 ml.

For complete information about Forhistal (including dosage, cautions, and side effects), see Physicians' Desk Reference or write CIBA, Summit, N. J.

FORHISTAL® maleate (dimethpyrindene maleate CIBA)
LONTABS® (long-acting tablets CIBA)

new Forhistal® rated better than previous therapy in 7 cases out of 10

CIBA
SUMMIT, NEW JERSEY

2/2910MK-1

six sizes
a thousand and one uses

The wide range of sizes of 'Vaseline' Sterile Petrolatum Gauze U.S.P. gives it a thousand and one uses in the hospital and the office treatment room. As a pressure dressing in surgery . . . an occlusive dressing in burns . . . an emollient dressing on dry and nonacute skin lesions . . . a packing in nose, eye, and ear procedures . . . here is a dressing that is convenient to use and of guaranteed, sealed-in sterility.

½" x 72" Selvage-edged Packing
(in disposable plastic tube)
Packing for nose, ear canal, or eye socket; submucous resection, rhinoplasty, ocular evisceration or other surgical intervention, nasal hemorrhage.

1" x 36" Strip
(in heat-sealed foil envelope)
Circumcisions, finger dressings, hand surgery, podiatric applications, small-area burns, pilonidal cysts, small packings.

3" x 9" Strip, and 3" x 3" Pad
(in heat-sealed foil envelope)
Skin grafts, colostomies, small-area wounds — traumatic or surgical.

3" x 18" Strip
(in heat-sealed foil envelope)
Burns, dermabrasion, traumatic wounds, eschar removal, abrasions, compound fractures, amputation stumps, urological and proctological work, and many other surgical procedures p.r.n.

3" x 36" Strip
(in heat-sealed foil envelope)
When a larger dressing is needed for the indications above.

6" x 36" Strip
(in heat-sealed foil envelope)
Extensive burns, pemphigus, cancer resections, large-area wounds.

'Vaseline' Sterile Petrolatum Gauze U.S.P.

Professional Products Division • Chesebrough-Pond's Inc., New York 17, N. Y.

Vaseline® is a registered trademark of Chesebrough-Pond's Inc.

TURN THE PAGE TO SEE WHAT CORDRAN™-N CAN DO

. . . AFTER ONLY TWO WEEKS' TREATMENT

Lilly

new topical corticosteroid

CORDRAN™

provides superior antipruritic and anti-inflammatory activity

Among the advantages:

• high effectiveness in low concentration • specific topical action with minimal systemic absorption • no reported sensitivity or side-effects

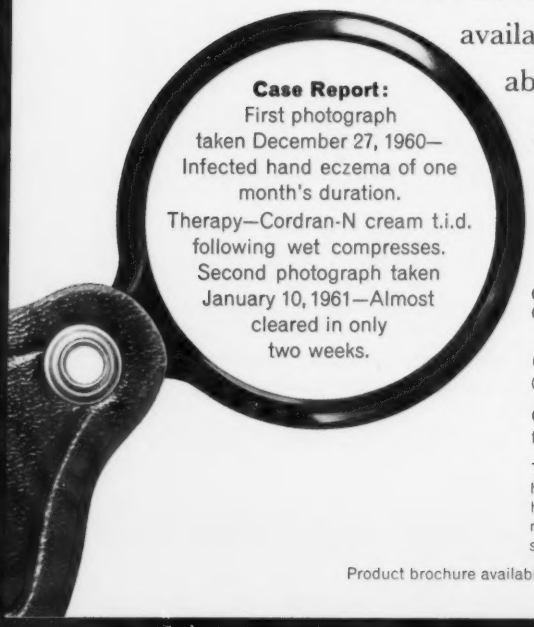
...and to combat infection

CORDRAN™-N

Cordran-N combines Cordran and the safe, wide-spectrum antibiotic, neomycin. It is particularly useful in dermatoses complicated by potential or actual skin infections.

Product Forms: Cordran and Cordran-N are available in both a cosmetically acceptable vanishing cream and a hydrophilic ointment base.

How Supplied: All forms are supplied in 7.5 and 15-Gm. tubes.


Case Report:
First photograph taken December 27, 1960—Infected hand eczema of one month's duration.
Therapy—Cordran-N cream t.i.d. following wet compresses.
Second photograph taken January 10, 1961—Almost cleared in only two weeks.

Cordran™ (flurandrenolone, Lilly)
Cordran™-N (flurandrenolone with neomycin sulfate, Lilly)

Cordran cream and ointment: Each Gm. contains 0.5 mg. Cordran.

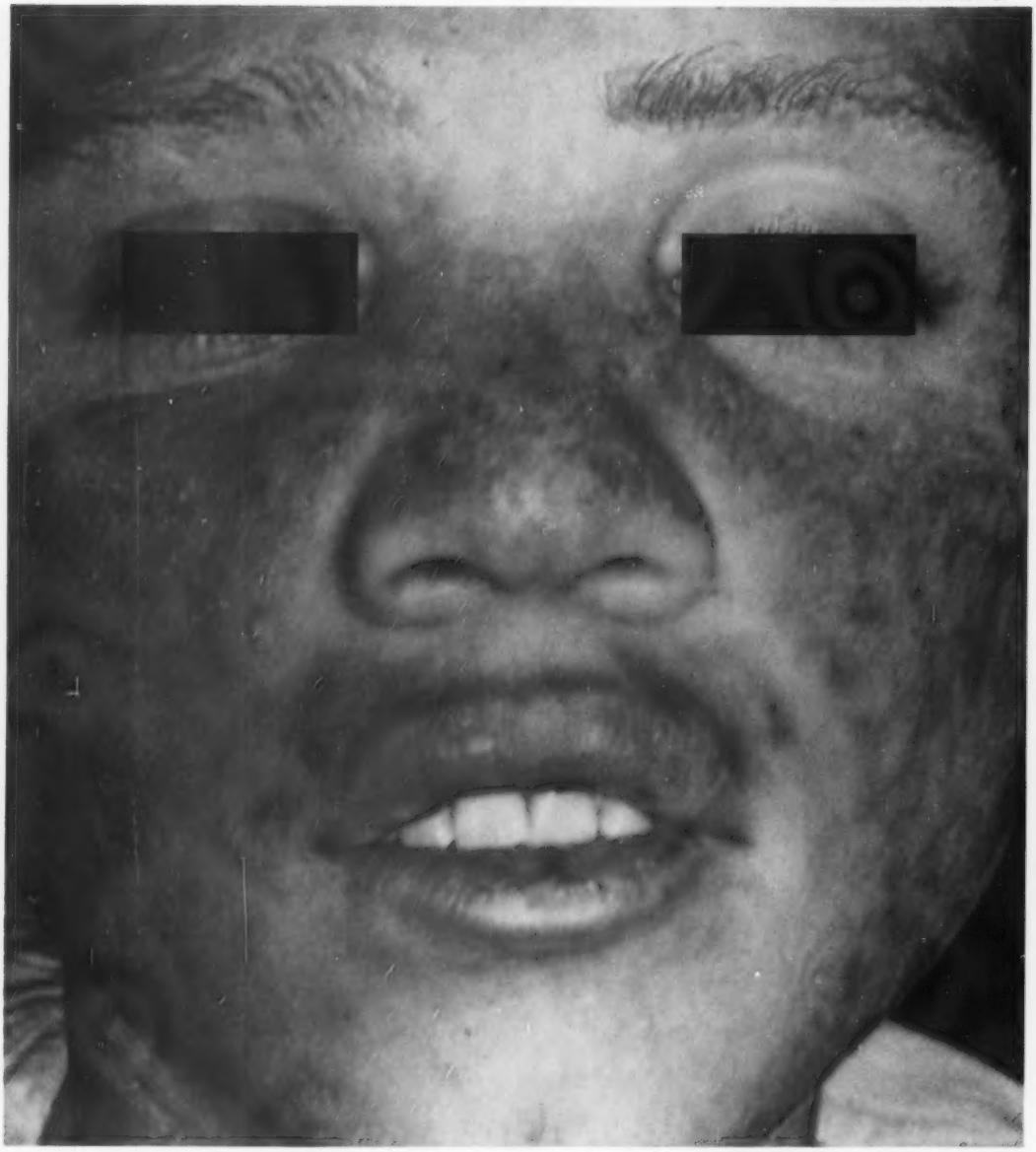
Cordran-N cream and ointment: Each Gm. contains 0.5 mg. Cordran and 5 mg. neomycin sulfate.

The cream base is composed of stearic acid, cetyl alcohol, liquid petrolatum, polyoxyl 40 stearate, ethyl parahydroxybenzoate, glycerin, and purified water. The ointment base is composed of white beeswax, cetyl alcohol, sorbitan sesquioleate, and white petrolatum.

Product brochure available; write Eli Lilly and Company, Indianapolis 6, Indiana

a case for HALDRONE™

(paramethasone acetate, Lilly)



In severe cases of **SYSTEMIC LUPUS ERYTHEMATOSUS**, the new corticosteroid, Haldrone, has demonstrated rapid remission of symptoms with little adverse effect on electrolyte metabolism. Haldrone provides predictable suppressive activity in steroid-responsive conditions.

Lilly
QUALITY / RESEARCH / INTEGRITY

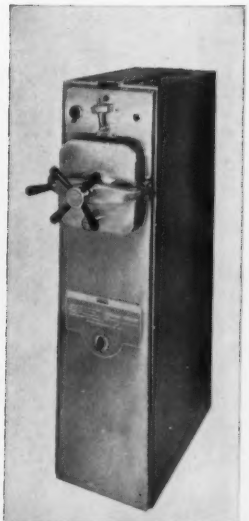
Suggested dosage in systemic lupus erythematosus:
Initial suppressive dose. . 6-12 mg. daily
Maintenance dose . . . . 4-8 mg. daily

Supplied in bottles of 30, 100, and 500 tablets:
1 mg., Yellow (scored)
2 mg., Orange (scored)

140240

Product brochure available; write Eli Lilly and Company, Indianapolis 6, Indiana

The 613-R Dynoclave
Low-cost, high-speed autoclave — portable automatic — efficient



The 1022 Aristocrat Autoclave
Office pressure steam sterilization to hospital standards and convenience

EVERY PHYSICIAN

CAN NOW GIVE PATIENTS THE POSITIVE PROTECTION OF PRESSURE STEAM STERILIZATION

The NEW 8816M Autoclave
Redesigned to meet the same exacting sterilization standards of the 8816, but at substantially lower cost and with greater capacity.

One of these Amsco Autoclaves can substantially aid your efforts toward improved patient protection against the contaminated needle, or other instruments in your office.

Assurance of the positive protection of pressure steam sterilization is a comfort appreciated most highly by the physician who has faced the problem of cross-contamination. There is an authorized Amsco Dealer near you — ready to advise and serve your requirements for sterilization equipment and adequate techniques. Mailing this coupon with your letterhead will bring full details . . .

AMERICAN STERILIZER
ERIE • PENNSYLVANIA

Service Centers in . . .
Atlanta, Boston, Chicago, Cincinnati, Dallas, Denver, Detroit, Los Angeles, New Orleans, New York City, Philadelphia, Pittsburgh, Richmond, St. Louis, St. Paul, San Francisco, Seattle, Tampa, Washington, D. C., including a dispersed Amsco Serviceman located near YOU for prompt service.

Send Bulletin on Autoclaves 613-R ☐ 8816M ☐ 1022 ☐ and location of nearest Amsco Dealer

Name _____

Address _____

City _____ Zone _____ State _____

twice
the
muscle
relaxant
potency
for greater
relief
of pain
and spasm

NEW PARAFON®

Combining a superior skeletal muscle relaxant[1-3] with a preferred musculoskeletal analgesic,[4,5] *new* PARAFON FORTE rapidly relieves *both* pain and muscle stiffness in low back disorders. Thus, the effective dual action of PARAFON FORTE increases the patient's range of motion and hastens recovery. PARAFON FORTE is equally effective in other musculoskeletal disorders, such as myositis, whiplash injuries, strains or sprains, and fibrositis. Side effects are rare, almost never require discontinuation of therapy.

FORTE

PARAFLEX® Chlorzoxazone* 250 mg.
TYLENOL® Acetaminophen 300 mg.

Dosage: Two tablets q.i.d. *Supplied:* Scored, light green tablets, imprinted "McNEIL," bottles of 50.

References: (1) Settel, E.: Clin. Med. *6*:1373, 1959. (2) Peak, W. P., and Smith, R. T.: Penn. Med. J. *63*:833, 1960. (3) Mayle, F. C.; Sullivan, P. D., and Auth, T. L.: Med. Ann. D. C. *28*:499, 1959. (4) Roth, J. L. A.: Med. Clin. N. Amer. *41*:1517, 1957. (5) Batterman, R. C., and Grossman, A. J.: J.A.M.A. *159*:1619 (Dec. 24) 1955.

*U.S. Patent No. 2,895,877

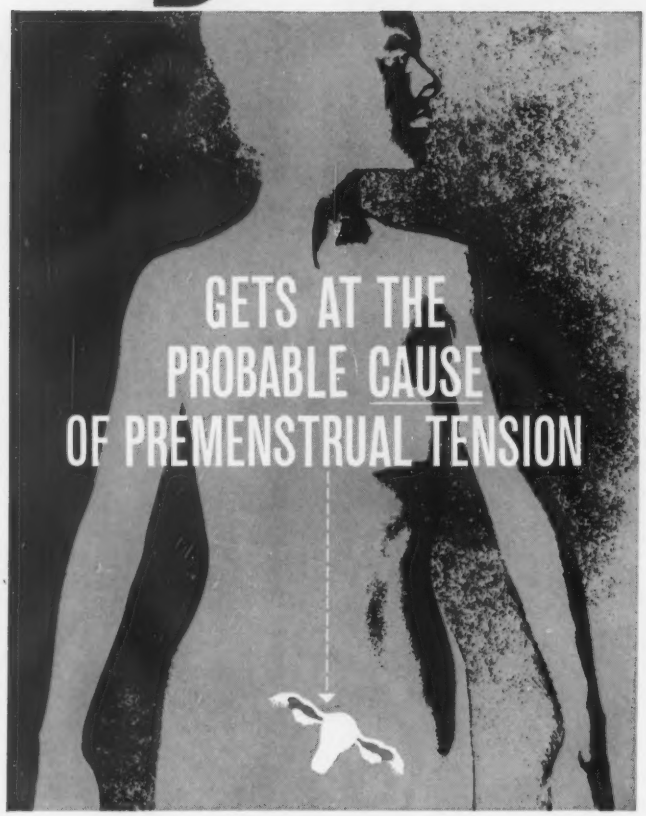
McNEIL LABORATORIES, INC., Fort Washington, Pa.

McNEIL

379A61

Upjohn

Cȳtran†

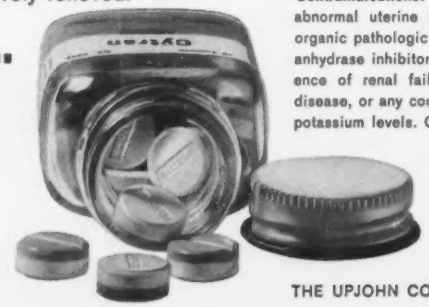


to restore hormonal balance...

CORRECTIVE THERAPY Because Cȳtran contains the new progestin, Provera*, you can now reach the probable cause of premenstrual tension—hormonal imbalance. The estrogen-progesterone ratio is adjusted to more normal premenstrual balance. Abdominal discomfort, shakiness, fatigue—symptoms incompletely controlled by mere symptomatic treatments—are often effectively relieved.

to comfort the patient...

SYMPTOMATIC THERAPY An effective diuretic (Cardrase*) and a mild tranquilizer (Levanil*) afford symptomatic relief during the time required to effect basic correction. They also supplement the activity of Provera in those patients in whom restoration of hormone balance does not completely eliminate edema and anxiety/tension.



Each tablet contains:

Provera (medroxyprogesterone acetate)	2.5 mg.
Cardrase (ethoxzolamide)	35 mg.
Levanil (ectylurea)	300 mg.

Usual dosage: 1 to 2 tablets daily, 5-10 days before the period.

Supplied: As layered tablets in bottles of 20 and 100.

Precautions: Side effects following the use of Cȳtran are rare. The patient should be observed for possible sensitivity to one or more of the components. Drowsiness, if seen, may be relieved by decreasing the dosage.

Contraindications: Cȳtran should not be used in patients with abnormal uterine bleeding until malignancy and all other organic pathologic conditions have been ruled out. Carbonic anhydrase inhibitors should not be administered in the presence of renal failure, hyperchloremic acidosis, Addison's disease, or any condition involving depressed sodium and/or potassium levels. Caution must be observed in the presence of symptomatic hepatic cirrhosis as acidosis may develop. Tranquilizing agents, generally, are not indicated in true depressive states without concomitant anxiety.

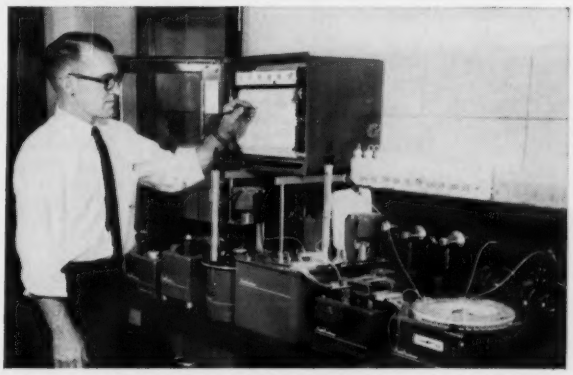
†TRADEMARK *TRADEMARK, REG. U.S. PAT. OFF.

THE UPJOHN COMPANY ■ KALAMAZOO, MICHIGAN

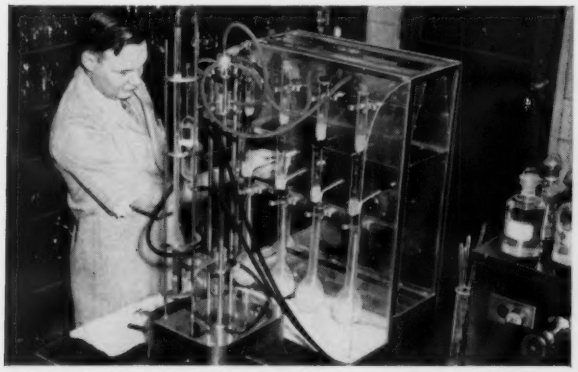
Smoking Out Tobacco's Secrets

Few plants have kept their biochemical secrets as well as tobacco. But investigations with ultramodern research methods are helping The American Tobacco Company pace the industry in developing the "science of tobacco."

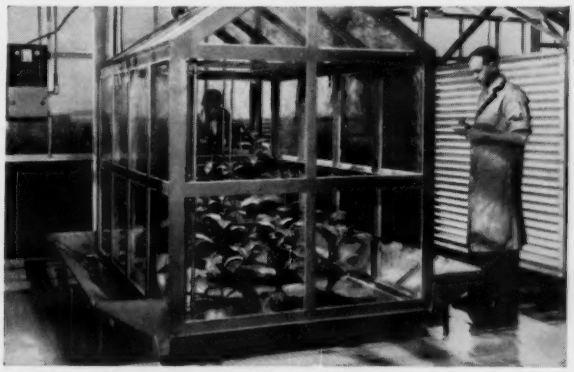
SOLVING TOBACCO'S GROWING PAINS. By collaborating with State and Federal Experiment Stations, American Tobacco is helping to push back the old frontiers. There is a revolution in the production of tobacco—new varieties, new cultural practices—new curing methods. American evaluates them all to improve its products.



UNLOCKING CHEMISTRY'S PUZZLE. American Tobacco has created and adapted numerous devices that increase the scope and precision of tobacco analysis. Typical of these is the Auto-Analyzer, recently adapted to the rapid and accurate determination of nicotine and sugar in tobacco and tobacco products.



STUDYING WHAT GOES UP IN SMOKE. For 50 years, American Tobacco researchers have been studying tobacco smoke. Today its chemical complexities are yielding to devices like this smoking machine, developed in our laboratories. Spectrometry and chromatography also help isolate these elusive components.



EXPLORING WITH ISOTOPES. By growing tobacco in radioactive nutriculture chambers like this, we obtain plants containing carbon 14 and/or tritium, excellent tracing elements. Counting systems and scalers in our Radiological Laboratory can then track down these elements and further analyze the components of tobacco and its smoke.

SHARING SCIENTIFIC DISCOVERIES. More than 25 years ago, The American Tobacco Company, recognizing the industry's need for greater knowledge in the field, initiated a continuing program of biological research in leading medical schools. The results have been published for the benefit of everyone interested in tobacco science.

The American Tobacco Company

FIRST IN CIGARETTE RESEARCH

©A. T. Co.

B-D YALE®

STERILE DISPOSABLE NEEDLES

for the benefits of disposability...

PLUS NEW

EASY-ENTRY POINTS
smooth, drag-free penetration

SAFER-HANDLING HUBS
surer finger grasp

TAMPER-PROOF PACKAGES
assured one-time use

FULL-PROTECTION SHEATHS
in the package—after filling—
to the moment of injection

now in sizes to meet most parenteral needs
manufactured, sterilized and controlled by

BECTON, DICKINSON AND COMPANY · RUTHERFORD, NEW JERSEY

In Canada: BECTON, DICKINSON & CO., CANADA, LTD., TORONTO 10, ONTARIO

a B-D DISCARDIT product

B-D, YALE, LUER-LOK, MULTIFIT AND DISCARDIT ARE TRADEMARKS OF BECTON, DICKINSON AND COMPANY

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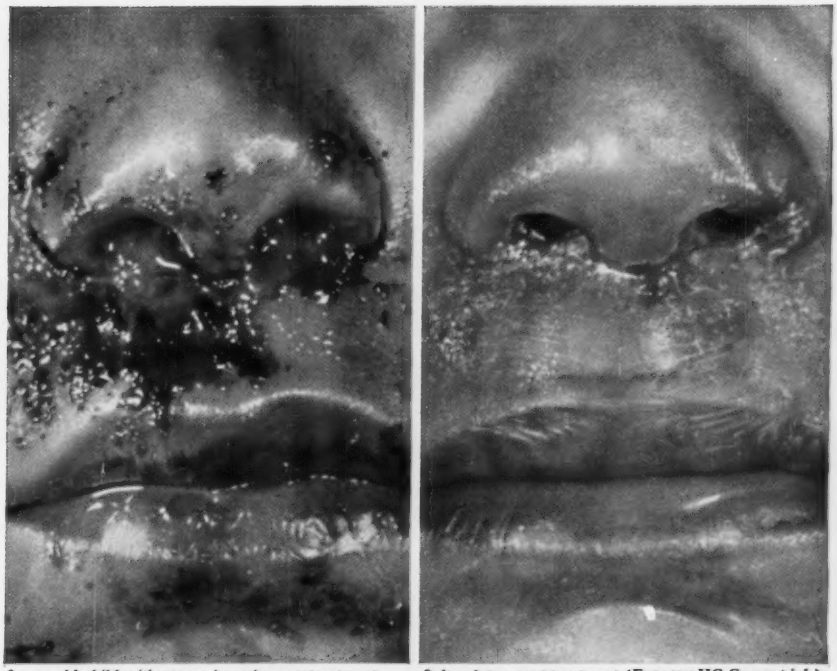


3-year-old child with severe impetigo, pretreatment

9 days later, post-treatment (FURACIN-HC Cream t.i.d.)

FOR BROADER TREATMENT OF INFLAMMATORY SKIN DISORDERS, BOTH ACUTE AND CHRONIC, WHERE INFECTION IS PRESENT OR IMMINENT

FURACIN®-HC CREAM

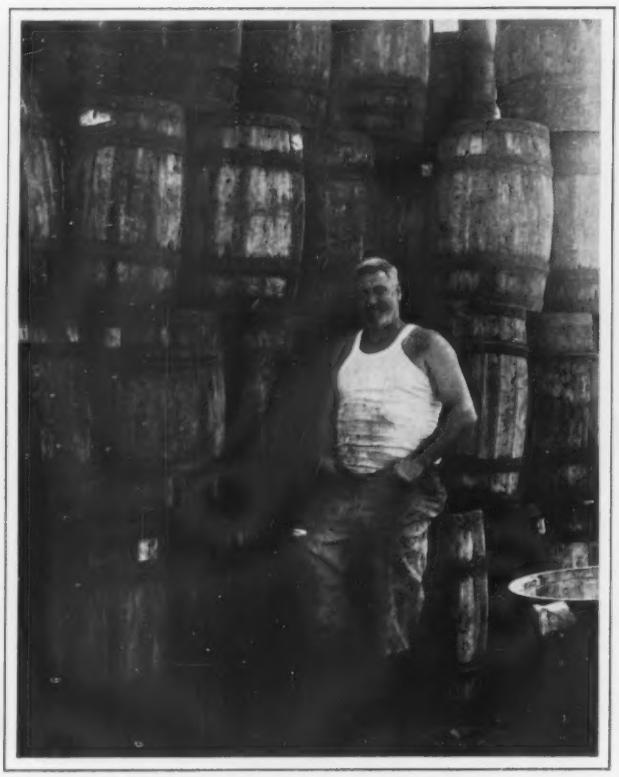
nitrofurazone 0.2% and hydrocortisone acetate 1%, Eaton

ESPECIALLY USEFUL FOR THE TREATMENT OF INFLAMMATION, ERYTHEMA AND PRURITUS AS WELL AS INFECTION IN SUCH CASES AS PYODERMAS, FURUNCULOSIS AND SECONDARILY INFECTED DERMATOSES

FURACIN-HC Cream combines the anti-inflammatory and antipruritic effect of hydrocortisone with the dependable antibacterial action of FURACIN—the most widely prescribed single topical antibacterial. Exclusively for topical use, FURACIN retains undiminished potency against pathogens such as staphylococci that no longer respond adequately to other antimicrobials. FURACIN is gentle, nontoxic to regenerating tissue, speeds healing through efficient prophylaxis or prompt control of infection.

FURACIN-HC Cream is available in tubes of 5 Gm. and 20 Gm. Vanishing-cream base, water-miscible.

EATON LABORATORIES, Division of The Norwich Pharmacal Company, NORWICH, N. Y.



He needs his muscles working properly—
when they aren't, he needs

Trancopal

How to use *Trancopal*®

Brand of chlormezanone

for painful muscles

When a muscle is strained, it goes into a spasm that produces pain; this is followed by more spasm for splinting, and then more pain.

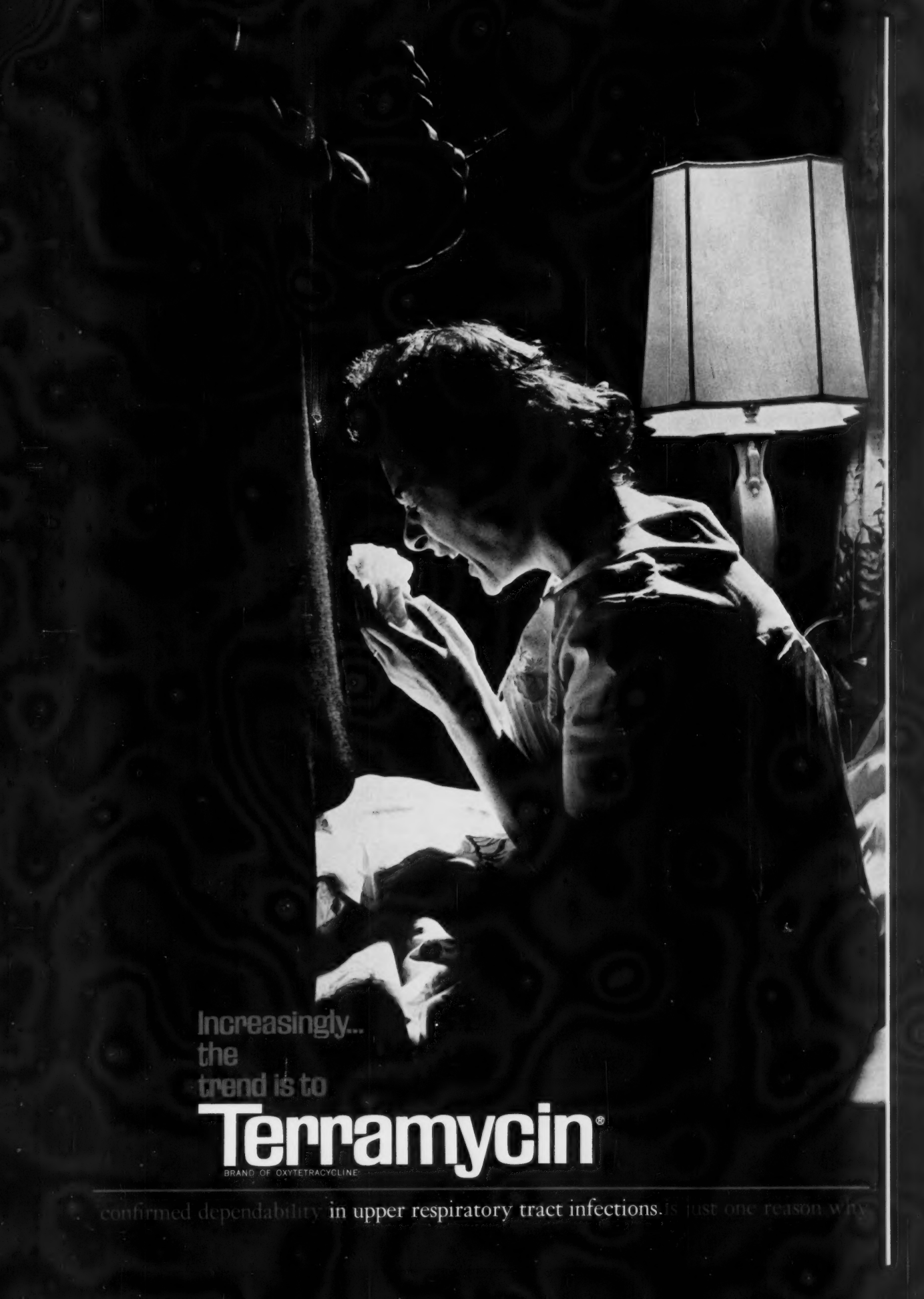
When you prescribe Trancopal, you break this vicious cycle and relieve the patient's discomfort. Trancopal will ease the spasm and consequently the pain, and its mild tranquilizing effect will make the patient less restless. You can then start him on purposeful exercise or physical therapy.

In addition to its usefulness in syndromes resulting from overstraining (such as low back pain or tennis elbow), Trancopal will relax the spasm and pain that are features of torticollis, bursitis, fibrositis, myositis, ankle sprain, osteoarthritis, rheumatoid arthritis, disc syndrome and postoperative muscle spasm. Trancopal is available in 200 mg. Caplets® (green colored, scored) and in 100 mg. Caplets (peach colored, scored), bottles of 100.

Dosage: Adults, 1 Caplet (200 mg.) three or four times daily; children (5 to 12 years), from 50 to 100 mg. three or four times daily.

Winthrop LABORATORIES
New York 18, N.Y.

1626M


Increasingly...
the
trend is to
Terramycin®
BRAND OF OXYTETRACYCLINE
confirmed dependability in upper respiratory tract infections is just one reason why

Jacques and Fuchs* recently reported on experience with Terramycin in 106 patients with a variety of acute and chronic upper respiratory tract infections, many of which had failed to respond to other antibiotics. Oral dosage was preceded by intramuscular injection in 44 cases. "It was the impression of the hospital staff that oxytetracycline [Terramycin] was not only better tolerated, but more effective than other antibiotics habitually used."

The investigators noted that "some of the best results were seen in patients who were most severely ill."

According to the authors, the availability of Terramycin as a preconstituted intramuscular solution makes it feasible "to treat serious infections with a broad-spectrum antibiotic that has rapid action, and to continue with the same antibiotic given orally as soon as the infection is brought under control."

The results reported in this and many other studies confirm the vitality of Terramycin for broad-spectrum antibiotic therapy and demonstrate why—increasingly—the trend is to Terramycin.

In brief

The dependability of Terramycin in daily practice is based on its broad range of antimicrobial effectiveness, excellent toleration, and low order of toxicity. As with other broad-spectrum antibiotics, overgrowth of nonsusceptible organisms may develop. If this occurs, discontinue the medication and institute appropriate specific therapy as indicated by susceptibility testing. Glossitis and allergic reactions to Terramycin are rare. As with all I.M. preparations, injection should be made within the body of a relatively large muscle. Care should always be taken to avoid injection into a major nerve or its surrounding sheath. For complete dosage, administration, and precaution information, read package insert before using.

More detailed professional information available on request.

Terramycin®

BRAND OF OXYTETRACYCLINE

INTRAMUSCULAR SOLUTION

50 mg./cc. in 10 cc. vials; 100 mg. and 250 mg. in 2 cc. ampules

the broad-spectrum antibiotic ready for immediate intramuscular injection . . . conveniently preconstituted . . . notably well tolerated at injection site with low tissue reaction compared to other broad-spectrum antibiotics

another reason why the trend is to Terramycin—*versatility of dosage form:*

TERRAMYCIN Capsules
250 mg. and 125 mg. per capsule—for convenient initial or maintenance therapy in adults and older children

TERRAMYCIN Syrup / Pediatric Drops
125 mg. per tsp. and 5 mg. per drop (100 mg./cc.), respectively—deliciously fruit-flavored, preconstituted aqueous suspensions

Science for the world's well-being® Pfizer

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc.
New York 17, N. Y.

*Jacques, A. A., and Fuchs, V. H.: J. Louisiana M. Soc. 113:200, May, 1961.

Pfizer *Science for the world's well-being®*

Dear Doctor:

Reports from our representatives indicate that many physicians would appreciate simplification for prescription-writing purposes of the names of Terramycin products in both the "plain" and the "Cosa" dosage forms.

The "Cosa" forms originated, you may recall, on the basis of clinical evidence of enhanced antibiotic absorption when glucosamine is employed in oral administration. To permit each physician individually to study this evidence and choose which form he would prefer to prescribe, we offered Terramycin in both forms—that is, in the regular Terramycin forms without glucosamine, and in the "Cosa" forms with glucosamine.

This distinction appears to be no longer necessary since glucosamine, a highly acceptable excipient for oral antibiotics, now is being incorporated uniformly in all such forms, thereby simplifying nomenclature and your prescription writing.

Accordingly, and effective immediately, forms incorporating glucosamine will be offered simply as Terramycin without the "Cosa" prefix.

To make clear just which forms are affected, please refer to the brief tabulation (below) of Terramycin dosage forms both *before* and *after* this change. We are also requesting our representative to call on you at an early date to answer any questions that may arise.

We feel certain that this action, prompted by your comments and those of many other physicians, will simplify your writing of prescriptions for Terramycin products.

We welcome your comments on this action and on any other phase of our operations, since it is our objective to render every service as efficiently as possible to our friends in the medical profession.

Sincerely,
PFIZER LABORATORIES

The following table indicates the former name and the current name of Terramycin systemic preparations:

FORMERLY NAMED	NOW NAMED
Cosa-Terramycin® Capsules	**Terramycin**® Capsules*
Cosa-Terrabon® Oral Suspension	**Terramycin** Syrup
Cosa-Terrabon Pediatric Drops	**Terramycin** Pediatric Drops

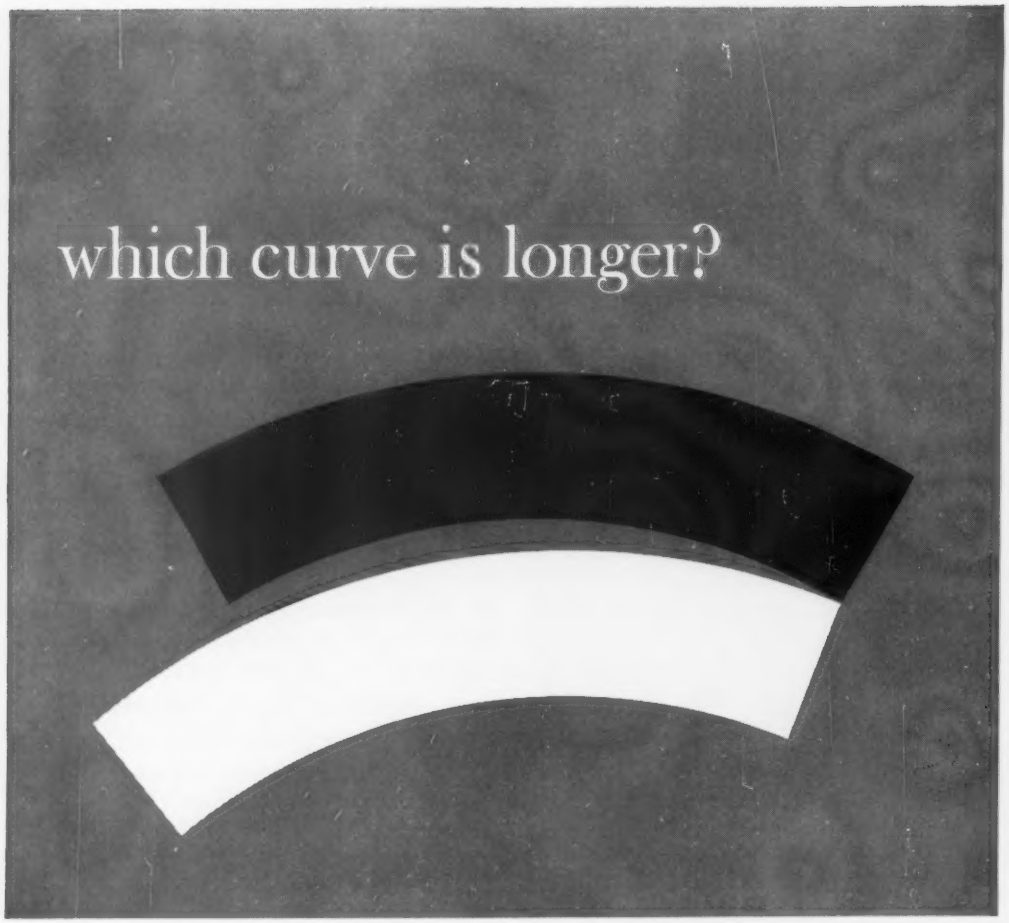
and simpler names for these Terramycin-containing formulations:

Cosa-Terrastatin® Capsules	**Terrastatin**® Capsules
Cosa-Terrastatin for Oral Suspension	**Terrastatin** for Oral Suspension
Cosa-Terracydin® Capsules	**Terracydin**® Capsules

. . . and these names remain unchanged:
Terramycin Intramuscular Solution
Terramycin Intravenous

**Terramycin Capsules* without glucosamine *are no longer available.*

The clinical versatility of Terramycin is enhanced by its specialized dosage forms adapted to individual needs—*another reason for the trend to Terramycin.*



Fascinating . . . how one curved figure seems to be longer than the other—even when you know they're both the same.

Two oral penicillins can be just as difficult to compare. If only the price of the drugs were to be considered, the choice would be clear. But isn't it what a drug *does* that counts?

V-Cillin K® achieves two to five times the serum levels of antibacterial activity (ABA) produced by oral penicillin G.[1] Moreover, it is highly stable in gastric acid and, therefore, more completely absorbed *even in the presence of food.* Your patient gets more dependable therapy for his money . . . and it's therapy—not tablets—he needs.

For consistently dependable clinical results

prescribe V-Cillin K in scored tablets of 125 and 250 mg.

V-Cillin K, Pediatric, in 40 and 80-cc.-size packages. Each 5 cc. (approximately one teaspoonful) contain 125 mg. (200,000 units) penicillin V as the crystalline potassium salt.

V-Cillin K® (penicillin V potassium, Lilly)

1. Griffith, R. S.: Antibiotic Med. & Clin. Therapy, 7:129, 1960.

133273

Lilly

Product brochure available; write Eli Lilly and Company, Indianapolis 6, Indiana.

IMS

Disabling Pulmonary Disease

Associated with Exposure

To Combinations of Industrial Dusts

• L. E. HAMLIN, M.D.
Chicago, Illinois

It has long been recognized that certain foundry employees have developed pulmonary abnormalities as a result of protracted exposure to industrial dusts containing mixtures of silica, iron oxide, and other components; however, such cases are relatively uncommon and can usually be explained when the hazards associated with the actual occupations are adequately investigated. This type of respiratory alteration has been described as "modified silicosis" or "mixed dust fibrosis" — names that are not entirely satisfactory since they lack specificity — but regardless of the terminology, individuals in this category present serious diagnostic problems and cause embarrassment when estimating disability or achieving rehabilitation.

Industrial hygienic investigations over many years demonstrate the various forms and atmospheric accumulations of dust particles to which workers in the foundry have been subjected. They also make clear the difficulty of differentiating between them and complicate the matter of assigning responsibility in the causation of disease of the lungs. As emphasized by Hatch,[1] "Dust concentrations produced by the various steps in the manufacture of castings such as molding, shaking out, chipping, casting cleaning, etc., vary greatly from one plant to another and also from day to day within a given plant. The dust exposure of molders, for example, is determined not only by the activities of the molders themselves, but is also dependent upon the layout and construction of the foundry, the degree of segregation of operation, intensity of foundry activity, and efficacy of the dust control techniques in force throughout the plant. Thus the atmospheric conditions must be evaluated in terms of the foundry operations as a whole, as well as from variations from the average which occur normally in the course of the plant procedures."

From the foregoing statements it is evident that an accurate occupational history, listing former specific jobs and their duration, is highly important. Unless the complete story is painstakingly obtained, a true evaluation of an employee's pulmonary disease is almost impossible. This is well illustrated in Case Report No. 2 which appears subsequently in this presentation. Diligence in ferreting out the facts is essential when apportioning accountability for compensation claims. It is also important in protecting the health of other plant personnel.

Many jobs in the foundry are classified as skilled or semiskilled, but before reaching this degree of proficiency, those in training are required to spend time at other work which includes general labor, the job of helper, etc., hence it becomes difficult to estimate the actual hours of exposure to offending airborne particles. A foundry grinder may have spent many years at his trade in which only a few periods have offered contact with dangerous dust, as for example, the era when vitrified grinding wheels

Figure 1
Stiff shaft grinder in action showing close proximity between wheel and operator's breathing zone.

were in common use. Wheels of this type, except for a few minor procedures, have not been employed in modern shops since the year 1930. The kind of machine being used also requires consideration. A man manipulating a stiff shaft grinder will have more direct contact with dust than one using the swing frame variety because the wheel of the stiff shaft grinder is much closer to his breathing zone (Figures 1, 2 and 3). A stand grinding machine offers practically no respiratory risk since it is usually equipped with built-in exhaust ventilation.

By the same token, hazardous atmospheres do not exist in the case of molders who work with conditioned sand which is moist and dustless. Other effective control measures include substitution of parting compounds like zirconite for silica flour along with elimination of old fashioned reprehensible practices employed in dusting copes and drags. In spite of these changes however, when trying to assess over-all exposure, it is still essential to explore the unsafe working environments to which an employee might have been subjected before newer methods were adopted.

Present day union rules that provide for bidding on various jobs result in frequent changes of occupation, depending on what the job pays and/or its undivided appeal. Accordingly, it is now unusual to find the same stabilized tasks that existed in the past, except possibly among the older workers. Changed plant environments resulting from mechanization, remodeling, exhaust ventilation, and dust control measures have to be taken into account, because the diagnosis of pulmonary occupational disease now requires much more information than the mere knowledge that an afflicted employee worked in a foundry, mine, or other place of employment which might have afforded exposure to dust. In this connection one could list other pertinent factors such as housekeeping, climatic conditions, changes in production, personal hygiene, proper use of protective equipment, and even individual susceptibility, but the essential aim is to make certain that *all* the important features associated

Figure 2
Swing frame grinder in operation on manganese steel casting. Note greater distance between operator's breathing zone and the wheel, also effect of exhaust booth in rear in removing larger particles of dust and smoke.

Figure 3
Double end stand grinder showing guard for grinding wheel used also as exhaust hood.

with the hazard are recognized and properly classified before arriving at a final conclusion. The foregoing observations are by no means new, but the lack of enlightenment among many of those charged with responsibility for the maintenance of health and administration of compensation laws is ample justification for their restatement.

Report of Cases

Case Number 1: This man, who was born in Mexico on September 10, 1904, began working at the age of 16 years in the orange groves of California. He picked oranges for two years and then took a job with a railway company and did track work from 1922 to 1925. Following this he worked on the shakeout in a steel foundry for three years, from 1925 to 1928. He then accepted a position as a grinder in another foundry and worked there for two years, from 1928 to 1930, before coming to his present location. He worked for the last employer from 1930 up to the time of his death in June, 1953, as a stiff shaft grinder on manganese steel castings and crane operator in the cleaning room.

The employee was accordingly exposed over a period of about 25 years to a combination of foundry dusts that eventually resulted in extensive, complicated, pulmonary occupational disease. His employment for three years on a steel foundry shakeout crew probably accounted for much of his exposure to free crystalline silica, especially since this occurred in an early period when adequate exhaust ventilation was conspicuous by its absence and when atmospheric concentrations of dangerous dust in all probability were high. His occupation for two years as a grinder in another foundry, from 1928 to 1930, as well as his experience as a stiff shaft grinder for several years after coming to the present company, might have offered additional exposure to siliceous dust for a time from the use of vitrified grinding wheels. Up to the year 1928, such wheels were still in operation, but after 1930 most grinding wheels were composed of a resinoid bond and aluminum oxide. A number of the vitrified wheels remained in use, however, for tool dressing and other purposes. Aside from these possibilities, most of the employee's employment in his present location as a stiff shaft grinder for 12 years and a crane operator for eight years in the cleaning room, involved exposure to considerable amounts of iron oxide along with lesser quantities of free crystalline silica. Petrographic analysis by the Saranac Laboratory of 12 pooled impinger samples collected from such typical cleaning room operations in October, 1942, showed quartz 3% and iron or other opaque material more than 66%. Most of the quartz particles were under 20 microns in diameter. Cristobalite was also present in the amount of 0.5%.

The employee continued working as a crane operator in the cleaning room from July, 1942, up to April, 1950, when he developed cough, chills, and blood streaked sputum. He was immediately hospitalized and placed under medical care.

In 1942, the company instituted a comprehensive medical program and the employee underwent a complete physical examination which in-

Figure 4 — Case 1

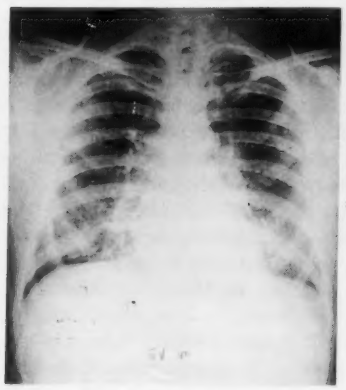


Figure 4-A
Roentgenogram taken in 1942 showing development of definite discrete nodular shadows with some increase in size and density of the hilar shadows.

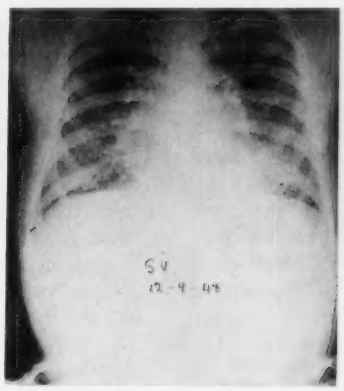


Figure 4-B
Film made in 1948 showing some further increase in size of the left hilar shadow with no significant change in the nodulation.

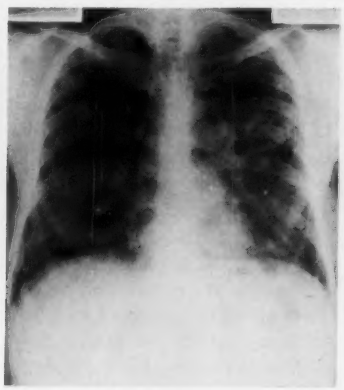


Figure 4-C
Roentgenogram made in March, 1950, showing development of tuberculous infection, far advanced with cavitation, in the left lung with some evidence of soft infiltration in the right lung at the level of the first and second interspaces.

cluded a 14 inch by 17 inch chest roentgenogram. The x-ray revealed sufficient obliteration of the linear markings throughout both lung fields to warrant a diagnosis of first degree nodulation. Some increase in size and density of the hilar shadows was observed and in addition, a small area appeared in the left apex which suggested a minimal early tuberculous lesion. The latter finding, although not definite, was marked for further observation. Subsequent chest roentgenograms by the company medical department in 1944 and 1946 revealed no further change, but in 1948, an increase in size and density of the left hilus was apparent. The enlargement was rather sharply demarcated and the possibility of Hodgkin's disease or other tumor was considered. Interestingly enough, carcinoma, which was disclosed only through autopsy five years later, had its site of origin in relation to a major bronchus at the left hilus.

The man was referred to a competent chest specialist[2] who carried out exhaustive physical examinations and laboratory analyses over a period of several months. Examination of the chest revealed diminished percussion over the upper half of each lung with fine moist rales in the lower lobes. There were also many fine rhonchi and wheezing sounds in the same areas. Fluoroscopic examination suggested a diffuse infiltration extending from both hila out into the mid lung field.

The electrocardiogram was within normal limits, and the remainder of the physical examination was essentially negative. A tuberculin test with first strength P.P.D. was positive at the end of 48 hours. An intradermal test with 1/10 cc. of 1-50 coccidioidin also was 2 plus positive at the end of 48 hours, and a skin test with a 1-1000 dilution of histoplasmin was negative. Because of the history of visiting the San Joaquin Valley and the positive coccidioidin test, serological tests for coccidioidin were made by the University Hospital, with negative results. Vital capacity was 2.7 liters or 62% of normal. The blood sedimentation rate was 35 mm. in one hour (Wintrobe) but the blood and urine examinations otherwise were negative. Sputum analysis was negative for tubercle bacilli on direct smear as well as on concentration and culture. Gastric contents also proved to be negative on concentration, and animal inoculation eight weeks later produced no positive findings.

Stereoscopic chest roentgenograms showed little change from the previous serial films except that some degree of eggshell calcification was seen in the right hilus along with a calcified nodule in the right apex. Pulmonary nodulation compatible with siderosis was noted without evidence of conglomeration or of superimposed tuberculous reinfection, but because of the presence of the eggshell calcification, the possibility of some degree of silicotic fibrosis was not ruled out.

At this time the prognosis appeared to be good and there did not seem to be enough evidence of disability to warrant taking the man off his job. Additional roentgenographic studies including planigrams were undertaken to determine the extent of the hilar adenopathy and rule out the presence of tumor. These confirmed the presence of eggshell calcification, enlarged hilar nodes, and pulmonary nodulation but no evidence of tumor, cavity, or compensatory emphysema was manifest.

The employee continued working at his job of crane operator up to April, 1950, when he became ill, as reported previously. Repeated sputum examinations at this time were positive for acid-fast organisms and a diagnosis of far advanced pulmonary tuberculosis with cavitation was made. The development of the acute tuberculosis appeared to confirm to some degree the presence of silicosis. Chest roentgenograms at this time demonstrated far advanced pulmonary tuberculosis with multiple cavities in the left lung. The fibrosis in the right lung and in the base of the left lung continued to have the same appearance as before except that it was more diffuse in character than that usually seen in typical nodular silicosis. However, a suggestion of nodulation appeared in many areas. The electrocardiogram was again normal at this examination.

The patient was started on streptomycin and para-aminosalicylic acid therapy and remained on this medication for approximately six weeks when it had to be stopped because of the development of an allergic dermatitis. His clinical condition improved while on this treatment but soon became worse again. Para-aminosalicylic acid with pyrabenzamine was then begun in small doses. This was tolerated well, but when streptomycin was again added the occurrence of moderately severe tinnitus necessitated its discontinuance. The para-aminosalicylic acid and pyrabenzamine were continued and the patient was kept on strict bed rest. In October, 1950, he was placed on dihydrostreptomycin intramuscularly and seemed to improve on this treatment. Soft infiltration had developed in the right lung at the level of the first and second interspaces in April, 1950, but this remained practically unchanged up to January, 1951; however, the tuberculous process in the left lung was definitely more extensive. The employee now had second stage siderosilicosis and far advanced bilateral pulmonary tuberculosis with massive cavitation in the left lung. The prognosis was definitely unfavorable.

In June, 1951, he suffered two episodes of right hemiplegia with loss of consciousness that were thought to be the result of a nonprogressive, atrophic left cerebral lesion — possibly secondary to air embolism or perhaps related to his tuberculosis. He was treated conservatively for this condition. No specific improvement occurred in the next few months in spite of the initiation of pneumoperitoneum and continued sanatorium care, and the patient died in June, 1953. Autopsy revealed in addition to the silicotuberculosis, the presence of a bronchogenic carcinoma which had metastasized to the adrenal glands, the regional lymph nodes and the peritoneum. There was also evidence of cor pulmonale with right heart failure. The bronchogenic carcinoma was thought to be a terminal event although the coroner indicated the cause of death to be silicotuberculosis.

Following this report, portions of both lungs were sent to the Saranac Laboratory, Saranac Lake, New York, for further pathological study. After a complete review of all aspects of the case, Dr. G. W. H. Schepers,[3] Director, submitted an opinion from which the following items are quoted.

> The parenchymal disease present in this case is of a dual nature and comprises on the one hand nodular silicosis (with some areas of siderosis and siderosilicosis) and on the other diffuse alveolar wall thickening. Associated with this there is considerable vascular damage and chronic bronchitis but hardly any emphysema.
>
> The silicotic disease occurs in the form of spherical nodules varying from about 0.5 mm. to 3 mm. in diameter. Some of the nodules are in a sense abortive and consist of loose intertwining reticulum and collagen bundles with numerous interspersed pigmented koniophores. At the other extreme, nodules show central hyalinization and particularly in the right upper lobe there is a marked tendency to confluence and conglomeration with de-aeration of intervening lung tissue.
>
> The diffuse interstitial thickening of alveolar walls is almost universally distributed, but most strongly represented in the pulmonary bases. The average alveolar wall is at least trebled in thickness and few escape the change. The main components of these altered walls is collagen and reticulum, the latter being dominant in some areas. Elastic tissue is well preserved. At some sites the alveolar wall thickening assumes the character of a small nodule composed of collagen, reticulum and capillaries. In other areas there is a more extensive and diffuse granulomatous infiltration which obliterates all semblance of lung patterns. Such areas generally have a very good capillary system. Among the fibres which compose these areas may be found numerous plasma cells and particle-laden koniophores some of which contain diatome fragments.
>
> There is no material degree of emphysema in this lung. At isolated points some rupturing of alveolar walls with confluence of adjacent air sacs has taken place, but these component spaces are not distended.
>
> Marked chronic bronchitis is present. Pus and cellular debris fill many lumina. The epithelium tends to be desquamated over extensive areas.
>
> In a section taken from a restricted parahilar area a limited grouping of neoplastic cells embedded within dense fibrous tissue was discovered. This is the only region at which carcinoma was found within sections from cut surfaces of the lungs exceeding 250 sq. cm. and representing the various lobes. It is possible, however, that some of the cellular debris contained within the bronchi may be of neoplastic origin.

CHEMICAL AND PETROGRAPHIC STUDY OF LUNG ASH

	Percent
Ash percent of dried tissue	8.02
Total SiO_2 percent of ash	17.41
percent of dried tissue	1.40
Free SiO_2 percent of ash	14.0 approx.
percent of dried tissue	1.1 approx.
Kinds of minerals in tissue:	
Quartz percent of ash	9.7
Cristobalite percent of ash	1.9
Diatomite percent of ash	2-3 approx.
Mica percent of ash	2-3 approx.
Amphibole percent of ash	trace
Component analysis percent of ash:	
SiO_2	17.41
Fe_2O_3	35.80

The histological features of the tissues examined are compatible with a diagnosis of advanced micronodular silicosis with infective conglomeration and associated siderosis. In addition, there is diffuse, chronic, interstitial, alveolar wall fibrosis but no significant emphysema. A chronic abscess cavity was displayed which may be of tubercular origin. The conglomeration of the silicotic nodules is certainly of the infective variety such as may occur in tuberculosilicosis. Associated with both processes there is a moderately advanced degree of peripheral pulmonary artery obstruction. There is advanced hypertrophic chronic bronchitis with bronchiolectasia and the lumina of the bronchi are choked with cellular debris which may partly represent retained de-

squamated epithelial cells. Terminal infiltration by adenocarcinoma was present at one focus. Apparently the carcinoma, which, according to the autopsy record, had its site of origin in relation to a major bronchus at the left hilus, disseminated mainly to the abdominal organs and lymphatics. Chemical and petrographic analysis of the ashed pulmonary tissue provides the final clue to diagnosis for it discloses that the subject had prior to his death inhaled considerable quantities of crystalline free silica in the form of quartz as well as a substantial amount in the form of cristobalite. There appeared also in the lung ash a moderate quantity of the amorphous free-silica mineral diatomite, but since diatomite does not yield an x-ray diffraction pattern the petrographic identification of this mineral is not as positive a finding as it is for the crystalline varieties of quartz and cristobalite. On the other hand, there was no mistaking the diatom fragments to be seen within the pulmonary tissues.

The value of the quartz content of the lung ash (9.7%) is higher than the average value (9.32%) for a series of 58 established silicotics previously studied in the Saranac Laboratory. The amount of cristobalite (1.9%) found in association with the quartz exceeds the quartz content (1.23%) of the lungs of 38 normal persons who had not previously been exposed to dust of occupational origin. This cristobalite was very probably derived from flux-calcined diatomaceous earth.

The presence of a larger quantity of iron (35.8%) in the lung ash agrees with the histological feature of siderosis and there is adequate explanation for this metal in this lung as the subject worked for a period of 24 years in environments and under circumstances where steel dust could have been respired in significant quantities.

It must be conceded also that it is possible that quartz or diatomaceous earth exposures may have occurred in the plants where he was active as a steel grinder. It is necessary further to determine whether the industrial history furnished is complete in all details. A relatively short period of exposure to exceedingly high dust levels has been known to provoke a considerable amount of silicosis and conceivably also the type of interstitial fibrosis present in this case.

Carcinoma, however, actually seems to have terminated this case. This, too, is a not too unusual sequence of events in silicotics. No causality may, however, at present yet be ascribed to the concurrent presence of either the carcinoma and the tuberculosis or the carcinoma and the silicosis.

Emphysema is conspicuous by its absence. This probably explains why even in 1950, when he had indisputable silicosis with tuberculosis, exertional dyspnea was not yet a symptomatic feature of his disease.

The cor pulmonale established at autopsy could be accounted for in terms of the extensive peri-arterial fibrosis and endarteritis obliterans present both within the areas of more advanced interstitial fibrosis and in relation to the conglomerating silicotic processes. Cor pulmonale is often seen in association with pulmonary neoplasm, but in this particular case the cancer has invaded lung tissue to so small an extent that it is unlikely that the heart disease arose from this cause.

In final analysis this appears to be a case in which the subject was exposed to dust containing significant amounts of iron, quartz, cristobalite, and diatomite. As a result of the effective inhalation of these dusts the victim developed siderosis with superimposed silicosis which in turn became complicated by tuberculosis. In other areas of the lung an interstitial fibrosis arose probably in response to the cristobalite and diatomite, and this process, plus the silicosis, caused sufficient damage to the pulmonary vascular system as to induce a cor pulmonale. Bronchogenic cancer arose as a terminal disease.

Case Number 2: This man was born in Poland on April 25, 1885, and his occupational history indicates that he began working in the U.S.A. at the age of 18. His first job was that of pick and hammer man in a stone quarry, where he worked for a period of 12 years from 1903 to 1915. Following this he was a millwright for an automobile manufacturer for 11 years (1915 to 1926). From 1926 to 1950, he was a grinder in a foundry manufacturing various types of special alloy castings. This operation offered significant exposure to iron oxide and to a minor degree, chromium. No health hazards due to free silica dust were disclosed by repeated industrial hygiene surveys in this plant which was new in 1948. Atmospheric conditions in the old foundry might not have conformed to those of the new structure.

The first chest x-ray was taken on this employee in August, 1944. Up to this time he had worked as a grinder in the old plant for 18 years. Fine nodular shadows suggestive of pul-

monary occupational disease were observed throughout both upper lobes of the lungs with probable similar involvement in the lower lobes, although the lack of adequate inspiration on this film did not allow sufficient contrast to demarcate these fine shadows in the lower lobes. In addition, there was a circumscribed area of density 1.5 cm. in diameter in the area of the left second interspace at the periphery that contained calcium. Calcification was also present in the left hilum. No perifocal activity was seen about this nodule and no other areas of infiltration were present in either lung. The heart and great vessels were normal in size, shape, and position.

Subsequent film studies in 1946, 1947, 1948 and 1949 showed no change other than possibly a slight increase in the definition of the nodulation throughout both lung fields. There was no change in the nodule in the upper left lobe nor in the left hilum. The heart remained essentially normal in size, shape, and position. An interpretation of these roentgenograms by a competent radiologist gave the following impressions.

1. Partly calcified and static old granulomatous lesion in the upper left lobe with associated calcification of the lymph nodes at the left hilum.

2. Pneumoconiosis Stage II with fairly discrete nodulation rather uniformly distributed throughout both lungs but somewhat more marked in the upper lobes. This is predominantly silicotic in type from the roentgen appearance. There may be an element of siderosis; however, this cannot be definitely established from the roentgen appearance of this chest.

3. There is no evidence of associated tuberculosis other than the probability that the solitary lesion, left upper lobe, represents a healed primary complex.

4. No significant cardiac abnormality.

The employee retired on May 1, 1950, at the age of 65 and became ill in February, 1952. He filed a claim for compensation in which the examining physician attributed the disability to "silicosis and pulmonary tuberculosis, manifested by cough, dyspnea, fever and x-ray evidence," and caused by "many years exposure to silica dust." The claim was allowed by the Industrial Commission and the man received compensation up until his death on September 6, 1954. His widow refused to have an autopsy performed, and because of this the Silicosis Referee Board denied her all rights to additional compensation. Later she gave her consent and the body was exhumed for further pathological study. The new claim for death benefits was contested on the grounds that the employee's occupation as a grinder had not offered adequate exposure to free crystalline silica during his term of service in this plant. This fact was recognized by the Silicosis Referee Board. A post mortem performed at this time for the Board disclosed, according to the report, that the lung tissue "morphologically had the appearance of anthrosilicosis, extensive fibrosis, degenerative disease of the lungs, pleural thickening, and bilateral hydrothorax."

The Silicosis Board of Referees personally examined the sections of lung tissue and reported that the microscopic picture showed that all the lesions of silicosis that were present were in a state of extreme maturity; that there was no evidence of tissue reaction to silicon dioxide within recent years, and that these facts gave significant medical confirmation of the Board's previous opinion in 1952 to the effect that there had been no proof of injurious exposure to silicon dioxide since the effective date of the occupational disease act in that particular state. The Silicosis Board's report concluded that death was due to the cardiac complications of advanced silicosis. The claim was allowed because the Industrial Commission concluded that death had

Figure 5 — Case 2

Figure 5-A
Roentgenogram made in 1944 showing fine nodular shadows throughout both upper lobes along with a calcified nodule in the area of the left second interspace.

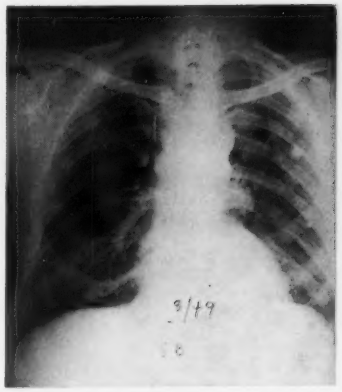


Figure 5-B (right)
Chest film made in 1949 shows more definite nodulation throughout both lung fields thought to be predominantly silicotic in appearance but with an element of siderosis which could not be definitely confirmed by x-ray. Pathological examination of lung tissue, however, indicated that much of the roentgenographic change was due to the siderotic component.

Figure 6 — Case 2

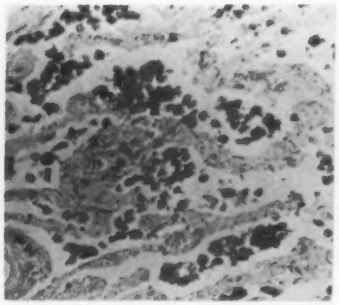


Figure 6-A
Photomicrograph, iron stain. Blue particles and masses of iron pigment lying free in the alveolar spaces. Little or no inflammatory reaction in adjacent alveolar walls. Magnification 90X.

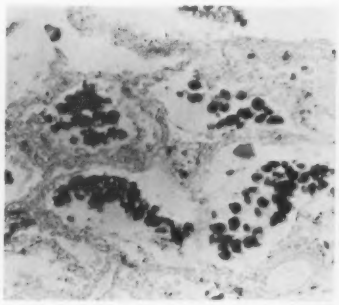


Figure 6-B (center)
Photomicrograph, iron stain. Blue particles and masses of iron residing in the alveolar spaces and very occasionally in a segment of an alveolar wall. However, there is an occasional black particle (non-iron positive) localized in the alveolar wall (as in the almost exact center of the slide). Magnification 90X.

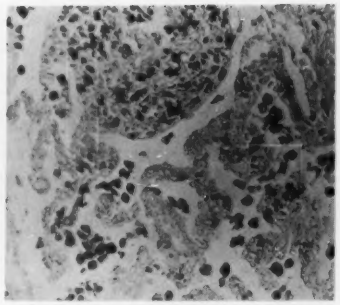


Figure 6-C (right)
Photomicrograph. Iron stain revealing positive blue particles and masses within phagocytes in the alveolar spaces. In contrast, note the black (iron negative) particles in the alveolar walls and accompanied by an appreciable inflammatory thickening of the alveolar wall. The latter is indicative of reaction to a biologically active dust which in this instance is presumably free crystalline silica, as indicated in Figure 6-D. Magnification 90X.

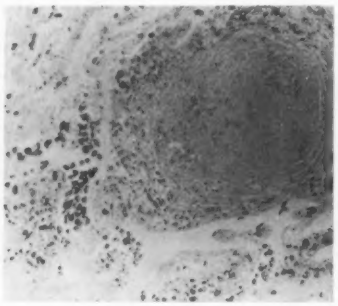


Figure 6-D
Photomicrograph. Iron stain again revealing blue particles positive for iron in the alveolar spaces and in an occasional alveolar wall. In constrast, however, the silicotic nodule contains primarily particles which are black and not positive for iron. Thus, the evidence is that the non-iron particles were the offending agents in the instance of this case. Magnification 45X.

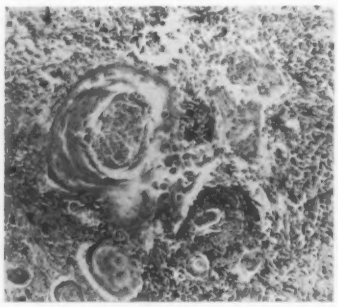


Figure 6-E
Photomicrograph of focal epithelial proliferation and metaplasia within an early confluent lesion of pigmented chrome inflammation with fibrosis. Note the absence of positive stained iron particles. Again, the evidence is that the inflammation and fibrosis were provoked by non-iron particles. The epithelial changes are interesting with reference to cancer of the lung.

resulted in 1954 from a disease of the respiratory tract contracted in the course of employment. The cost of the claim, however, was charged to the State Surplus Fund for occupational disease, partly because the Silicosis Board of Referees was unable to differentiate between siderosis and silicosis, and also because significant exposure to free crystalline silica had not been demonstrated during the employee's years of service at his last occupation.

Specimens of lung tissue were obtained and submitted for further study along with all the details of the case, to Dr. Arthur J. Vorwald,[4] Professor and Chairman of the Department of Industrial Medicine and Hygiene, Wayne University, Detroit, Michigan. Dr. Vorwald reported as follows:

> Pathologically, sections of the lung exhibit scattered well defined silicotic nodules. The majority of these nodules are modified by the presence of black and brown pigment, much of which is probably iron oxide inhaled during the individual's occupation as a grinder. The iron oxide pigment is distributed throughout many of the nodules and occurs also as colors about most of them. In addition, many of the alveolar spaces contain scattered phagocytic cells laden with pigment probably representing the more recent acquisition of the inhaled iron oxide. There is no evidence of tuberculosis. From a pathological point of view, the case is one of moderately advanced siderosilicosis. Although much of the roentgenographic change is undoubtedly due to the siderotic component, I doubt whether it can be differentiated roentgenographically from the silicotic shadows. However, it may be that because of the siderotic component

Figure 7 — Case 3

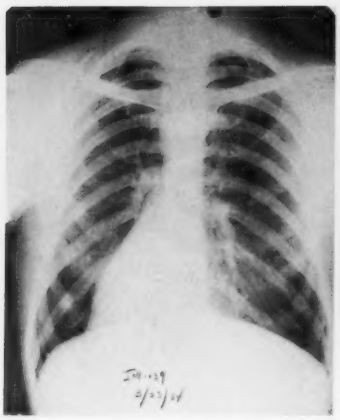


Figure 7-A
Roentgenogram made in 1934 interpreted as being within normal limits.

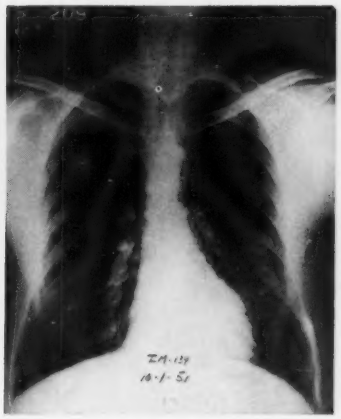


Figure 7-B
Film made in 1951 shows some exaggeration of the linear markings with suggestion of fine scattered nodular densities in the lower lung field, otherwise no change from film of 1934.

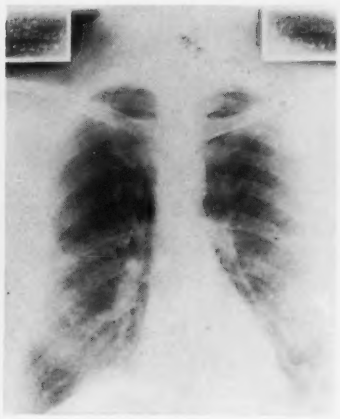


Figure 7-C
Roentgenogram obtained in 1953 shows development of small parenchymal density at the level of the base of the right upper lobe.

the nodular shadows are less defined than is the case for classical unmodified silicosis."

The accompanying illustrations demonstrate clearly the pathological reaction in the lungs resulting from exposure to this particular combination of industrial dusts.*

Case Number 3: This man, a native of Missouri, began work in 1909 at the age of 14, but his first recorded occupation was that of a boiler washer for a railroad company. He quit this job after a year and then accepted employment as a laborer with a large packing company. After two years with this organization, he started working with the present company as a laborer in the foundry in 1931. In 1940 he became a cupola charger, but in 1947, he was transferred back to the job of laborer. From 1949 to 1953, he was employed as a stock handler in the wire room.

The first chest roentgenogram on the employee was made in March, 1934, and was interpreted as being within normal limits. Subsequent chest films in 1948, 1949, 1950, 1951, and 1952 revealed some exaggeration of the linear markings along with a suggestion of fine scattered nodular densities in the lower lung fields; otherwise no significant change was observed. In a routine chest x-ray examination in 1953, however, a slight increased parenchymal density at the level of the base of the right upper lobe was noted and the employee was referred to the local chest clinic for further study. At this time he complained of dyspnea, cough, and asthmatic wheezing, for which medical treatment was advised.

Figure 7-D
Film made in 1954 showing further increase in the shadow previously noted in the right lung.

On November 9, 1953, a sputum smear was reported positive for tubercle bacilli by the chest clinic and a diagnosis of moderately advanced pulmonary tuberculosis was made. Sanatorium care was instituted on December 1, 1953. Sputum examination (concentrated) at this admission was negative but the patient was placed on streptomycin, 1 gram daily and rimifon, 400 mg. daily. Six weeks later his physical condition was re-evaluated and his sputum was again negative for acid fast bacilli. He was kept in bed and remained on therapy for moderately advanced ac-

*Pathology sections and captions were supplied through the courtesy of A. J. Vorwald, M. D., Wayne State University, Detroit, Michigan.

Figure 8 — Case 3

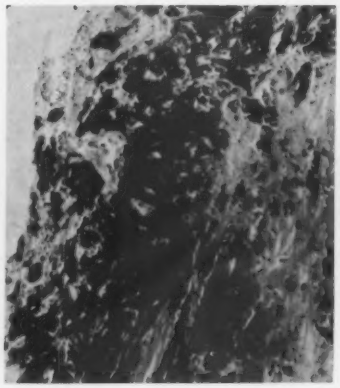


Figure 8-A
Focal deposits of pigment in a segment of an alveolar wall which manifests appreciable thickening provoked by the proliferation of connective tissue, the deposition of collagen and the formation of fibrous tissue. Much of the pigment gives a positive reaction for iron. Stain Prussian Blue. Magnification 90X.

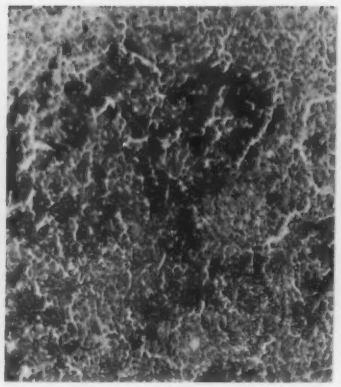


Figure 8-B
Focal deposits of pigment in the tracheobronchial lymph node. It is important to note the absence of associated inflammation. Stain, Hemotoxylin and Eosin. Magnification 90X.

Figure 8-C
Photomicrograph of the primary squamous cell carcinoma at the site of its origin in the bronchus. A portion of the bronchial cartilage is seen in one corner of the slide. Stain, Hemotoxylin and Eosin. Magnification 90X.

tive pulmonary tuberculosis. The employee appeared to be making satisfactory progress over the next few months. His sputum remained negative and he gained 15 pounds in weight. He was released from hospital in November, 1954, with a negative sputum and stationary x-ray film, but was placed on a total and permanent disability status under the company health insurance plan because of his alleged tuberculosis. During the course of his post-hospital follow-up, an increase in the density in the right mid lung field was observed and because of the persistence of this shadow, an exploratory thoracotomy was advised. This was refused by the patient. On the basis of studies to that time, a diagnosis of "atelectactic silicosis nodule" was considered according to a medical report submitted by the local city Health Department Tuberculosis Hospital. Hospitalization was continued because of constant change noted in the x-ray film in which the shadow seemed to increase at times and then retract.

Bronchoscopic examination was negative for P.A.P. stain, but there was noted a rather heavy amount of acute inflammatory cells in some areas and groups of hyphae which on magnification revealed a possible unidentified fungus. Pneumonectomy was performed on the right side in 1957 and the upper lobe was found to be rather dense and atelectatic. The bronchus was thickened, roughened, and almost completely occluded, and microscopic sections of the tissue revealed a squamous cell carcinoma of the right upper lobe bronchus with obstruction and secondary pneumonitis; metastasis to the hilar lymph nodes was present.

Specimens of lung tissue were submitted to Dr. Arthur J. Vorwald,[5] Professor and Chairman of the Department of Industrial Medicine and Hygiene, Wayne State University, Detroit, Michigan, for further study, particularly with reference to the relationship of the man's lung condition to his occupation. After exhaustive examination that included a review of the occupational history, serial chest roentgenograms, industrial hygienic aspects and clinical reports, Dr. Vorwald presented the following findings.

MICROSCOPIC PATHOLOGY: The variously stained tissue preparations disclose a well defined carcinoma, that is epidermoid in type and bronchogenic in origin, and peribronchial lymph nodes.

The primary cancer site discloses relatively little particulate pigment, except for the occasional deposits which are focalized in the connective tissue framework between the clusters of malignant cells.

Sections of the pulmonary parenchyma, per se, do not disclose the presence of metastatic foci of cancer. These sections reveal changes consisting of purulent bronchiolitis, atelectasis, irregular and frequently confluent small areas of chronic pneumonitis characterized by diffuse proliferation of the pigmented connective tissue with focal areas of diffuse fibrosis. The pneumonitis

obliterates much of the pulmonary architecture, and also compresses and distorts the entrapped bronchioles. Many of the persistent alveolar spaces between the areas of chronic pneumonitis are filled with eosinophilic precipitate (albumoid) which often contains a few scattered leucocytes including those of the polymorphonuclear type.

With respect to the lymph nodes, some are almost totally replaced by metastatic foci of epidermoid cancer. Black and brown pigment is sparsely scattered throughout the cancer tissue, but it is often concentrated in the connective tissue framework. Other sections of nodes fail to disclose metastatic foci of cancer, but they are moderately hyperplastic and exhibit scattered deposits of black-brown pigment.

In regard to the pigment, sections of the lung and lymph nodes reveal scattered deposits of black-brown particulate material. Special stains disclose that much of that pigment gives a positive reaction for iron. The pigment is found within the cancerous tissue, being localized primarily within bands of the connective tissue framework. In sections of the lung, the pigment is situated mainly in areas of connective tissue proliferation. However, pigment is also found scattered throughout the parenchymal tissue which shows little or no inflammatory response with respect to the lymph nodes. The pigment occurs mainly in the connective tissue framework of the tumor tissue. However, in the nodes without tumor, there are diffuse and focal deposits of pigment and here it is unattended by any appreciable chronic inflammatory reaction.

Sections of the tissue submitted for examination do not disclose histologic evidence of tuberculosis or of silicotic nodulation.

On the basis of these studies it was Doctor Vorwald's opinion that this employee did exhibit some degree of pneumoconiosis due to pulmonary deposition of dust which gave a positive reaction for iron and that this was occasioned by an occupational exposure to inhalable particles of iron oxide. Industrial hygiene surveys in the plant demonstrated that iron oxide was found to be present at the cupola in 1946 in concentrations of 47.6 mg. per 10 cubic meters of air. High iron oxide concentrations of 215 mg. and 195 mg. respectively per 10 cubic meters of air were present at the cupola spout area. Furthermore, it was learned that in this particular plant, the cupola was hand charged and it was necessary for the employee to stand directly in front of the charging door during his entire working shift. The charging floor was also situated directly above the area where the bull ladle was filled with molten iron and was separated only by a metal platform. Considerable iron oxide fume was consequently released into his working area from this source.

During the earlier years of his employment, the man's serial chest roentgenograms revealed no definite evidence of radio opaque nodular shadows typical of siderosis. Increased markings suggestive of prenodulation were observed in the lower lobes, but even in the last film there was not enough change to warrant a diagnosis of fully developed siderosis. In view of the histopathologic findings, however, the presence of some degree of this occupational condition must be admitted. Free crystalline silica did not appear to be a factor in this case nor did pulmonary tuberculosis in spite of the fact that the man had undergone intensive treatment for the latter. Subsequent evaluation of the case indicated that the initial single positive sputum report should be disregarded since the presence of pulmonary tuberculosis had not been adequately confirmed. The final conclusion was that the employee was afflicted with a primary bronchogenic carcinoma which had no causal and/or aggravating relationship to his occupational exposure that involved the inhalation and pulmonary deposition of iron oxide dust.

Progress reports in July and September, 1957, indicated that the employee seemed to be feeling well except for some shortness of breath on exertion, but in December of that year he died suddenly because of "arteriosclerotic heart disease" as recorded on the coroner's report.

In summary, this was the case of an employee who had no significant exposure to free crystalline silica yet was suspected at one time of having an "atelectatic silicotic nodule." Serial chest roentgenograms failed to demonstrate the presence of definite nodular shadows typical of siderosis, although hygienic plant surveys indicated adequate exposure to iron oxide dust and fume and pathological examination of lung tissue confirmed the pulmonary deposition of these substances. The man was subjected to several months' treatment and hospital care for suspected tuberculosis which remained unconfirmed either clinically or through examination of lung tissue removed at operation. A shadow observed in the lung in 1953 proved to be a bronchogenic carcinoma when removed surgically in 1957. Death occurred suddenly 10 months later from what was described as arteriosclerotic heart disease.

Comment

Pulmonary reactions to mixed dusts vary considerably among workers in different industries

and not all those exposed develop occupational disease of the lungs. In discussing the causes of silicosis, Cummings,[6] in 1939, stated that "only a limited number of individuals ever contract 'pure' silicosis since most hazardous occupations involve exposure to mixed dusts, and the pulmonary process which develops is consequently a silicosis modified by other less active constituents." He mentioned the possible shielding influence of these modifying and inert materials, but pointed out that "the granite cutter protected by alumina, the anthracite miner protected by carbon, the iron miner protected by hematite, all contract silicosis even though atypical *if sufficient exposure* to silica itself is offered."

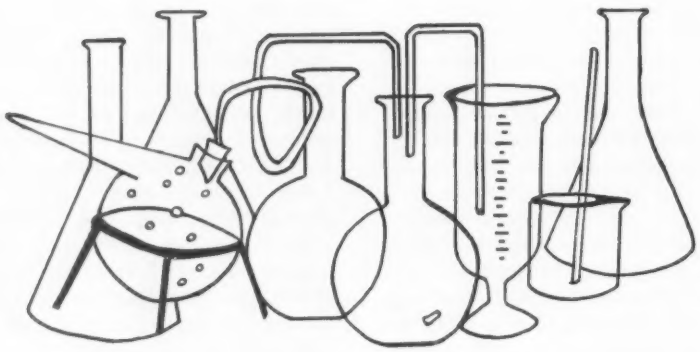
In many of these cases, it seems likely that the damage to the lung tissue results from the fibrogenic constituent of the dust which is usually free crystalline silica in one of its several forms, namely, quartz, tridymite or crystobalite. An amorphous type of uncombined silica like diatomite may also be a causative element, particularly in those areas of the country where deposits of this material are known to exist. Such an example occurs in Case Report Number 1, in which chemical and petrographic analysis of the lung ash revealed from 2% to 3% diatomite. This employee's foundry experience happened to be in the California coastal area where diatomaceous earth is found, so that it is possible that he had enough exposure to this substance to produce the scattered foci of interstitial fibrosis observed in the microscopic sections of the lungs.

Summary

Three instances of disabling pulmonary disease associated with exposure to combinations of industrial dusts, occurring in foundry workers, are presented. The cases depicted direct attention to the wide range of possibilities involved in arriving at a reasonable diagnosis of occupational afflictions of the lungs, and emphasize the need for unbiased judgment in evaluating the worker's physical ability to continue his chosen means of making a livelihood.

References

1. HATCH, T.: The Foundry Dust Problem. *Proceedings of the Fourth Saranac Laboratory Symposium on Silicosis.* Page 252. Saranac Lake, New York, June, 1939.
2. SMART, H.: Personal communications, September, 1948 - April, 1950.
3. SCHEPERS, G. W. H.: Medical report, June 4, 1955.
4. VORWALD, A. J.: Personal communication, September 7, 1955.
5. VORWALD, A. J.: Personal report, April 8, 1957.
6. CUMMINGS, D. E.: The Etiology of Silicosis. *Proceedings of the Fourth Saranac Laboratory Symposium on Silicosis.* Page 28. Saranac Lake, New York, June, 1939.



The Multiple Reactor in Industrial Dermatology

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In industrial dermatology the problem of the multiple reactor is important. Although this type of skin reaction has been known since the early days of skin testing, in recent time too little attention has been paid to it, even by dermatologists, and too little investigative work has been done.

From our early days at the Dermatologische Klinik in Zurich, we can remember the arguments of Bloch, Stauffer, Jadassohn, Miescher, and Burkhardt about the multiple reactions observed in routine patch testing of any large number of patients. Here in the Department in Cincinnati our interest in this subject continues to be aroused in our investigative studies of patients who have been admitted to the hospital for hand immersion testing under Suskind and his associates,[1] for insect sensitivity studies, and for various forms of eczematous dermatitis.[2] In the hospital, these patients have all had many detailed studies including extensive skin testing. In this manner, we have begun our study of the multiple reactor.

It is our feeling that the broad definition of the multiple reactor is not well understood by physicians, including dermatologists, nor, unfortunately, by compensation boards and by insurance carriers. Today, we believe that the multiple reactor is an individual who reacts not only to chemical stimuli but also may react widely to mechanical factors, physical agents, including all forms of radiation, and even to the social stimuli of his environment. In the past, the multiple reactor was called a multivalent reactor or polyvalent reactor and it was believed that he was an individual with a hypersensitive skin who reacted with eczematous responses to many different, diverse, and even unrelated materials. The fact that these materials would be substances with which he had never come in contact, substances with which he had not been concerned at all in his job or home environment, was not well understood or recognized.

It is again important to emphasize the significance of the multiple reactor. A multiple reactor acquiring an industrial dermatitis obviously has his dermatitis prolonged for a considerable period of time. This means great loss in earned income, increased demands on his insurance carrier, and even increased expenditures of government funds. Moreover, the problem of job placement for such a reactor is also difficult.[3]

The incidence of such a reactor in the broad sense of the term, unfortunately, is not known. It is assumed to be approximately 1 to 2%. We do not know if the incidence of this reaction is increasing. As indicated previously, it was in the study of the syndrome of eczematous hand dermatitis that we found most of our cases of the multiple reactor. In 146 cases of hand dermatitis studied, only 14 were found to be proved contact eczematous dermatitis with the specific contactant identified. Five other cases had multiple positive patch reactions that varied from time to time with no correlation to job or home work. All these five cases had chronic dermatitis with acute flares and with frequent spread of disseminated lesions over the arms and often the face and neck. Change of job produced no lasting effect. Hospitalization gave only temporary improvement. Again, as Trasko[4] has insisted for such a long time, there is real need for good statistics here. This is difficult since there are no good statistical data as yet in this country for industrial dermatitis.

Clinically, this individual presents varying degrees of extensive dermatitis, eczematous, subacute, and more frequently lichenified types, distributed not only on the exposed areas of the hands and forearms; this may be quite extensive even to an exfoliative dermatitis. As indicated, there is a history often of recurrent episodes, apparently unrelated to his work, to his home, or to any obvious stimuli.

Initially, the removal from the job may help;

Presented at the American Academy of Dermatology and Syphilology Symposium on Industrial Dermatoses, Dr. Donald Birmingham, Director, Chicago, December, 1960.

later on, this separation has no value and may aggravate the condition if there is a salary loss. The patients are usually middle aged; occasionally it occurs in young workers but usually not in the elderly group. Probably because of the proportion in industry, in our experience it is the men rather than the women who are affected.

When we consider the background of these individuals, we find some with an atopic background, most without such. In our series of 146 cases of eczematous hand dermatitis only eight had a history of atopic dermatitis. We believe, then, that for most this is an acquired form of reactivity. Varying combinations may exist with eczematous dermatitis associated with eczematous skin test reactions and associated with mechanical irritation, or to dermatitis from light. In some patients with clinical and proved photodermatitis there may be eczematous reactions to chemical materials.

Clinical cases have shown multiple reactions to different chemical agents. Some patients have shown multiple eczematous contact dermatitis and insect hypersensitivity, both of the eczematous and the delayed tuberculin type of response. We have had patients with photo-allergy who have reactions to eczematogenic materials.

It is our impression, without statistical data, that the ichthyotic or seborrheic skins are not more prominent, nor is the blond color type more prominent in this series. When detailed analyses are available of the background of these, we will have more definite information on the significance of the skin type.

The following are selected cases followed through frequent periods of hospitalization. In the hospital, the patient can be controlled better, followed more closely, and testing procedures can be observed more critically.

F. F. age 63. Exfoliative dermatitis, severe
Porphyrins — negative
Positive patch test reactions — goldenrod ++, repeated ++
"Routine" patch test set — all negative (Nickel, turpentine, paraphenylenediamine, formaldehyde, pyrethrin)
Light sensitivity studies +++, repeated often +++

L. G. age 55. Recurrent eczematous contact dermatitis
Routine patch test — 0
Positive patch test reactions:
Methylcellulose ++
Nitrogen mustard +++
Japanese lacquer ++
Mosquito extract (patch test) ++

W. B. age 34. Recurrent eczematous dermatitis, "nummular" type
Turpentine ++, repeated 3 months ++
Nickel sulfate — 0
Cobalt nitrate +++; repeated 3 months — 0
Formaldehyde ++, repeated 3 months +
Mercury bichloride +, repeated 3 months — 0

One can conclude only that such varied reactions indicate a hyperreactive skin.

A factor that has interested us considerably, one that we feel strongly needs much more attention, is the study of the personality background of this multiple reactor. In industry, there are groups that are known as accident prone. We feel that this multiple reactor individual is one who may be called dermatitis prone. Whether he is also a disease prone individual with evidence of repeated incidence of infections or hypoglobulinemia, as yet we do not have any data. In brief, then, the patient is usually a discouraged individual, a sad-sack or nebbisch type, with his continued disability from recurrent dermatitis, continued decrease in his income, and continued difficulties with family and social life.

The psychosomatic features, then, of this multiple reactor are also important. It is not strange that when a workman has lost so much time at his job and has so many economic problems there should be family conflicts and also job conflicts. What the relationship of these disturbances is to the causal background of the continued dermatitis, we do not know. We have insisted on a psychiatric examination on each multiple reactor admitted to the hospital for study. In the past this psychiatric examination consisted only of one or more interviews with the consulting psychiatrist. In the absence of a social history of the family or of his job by a trained social worker, we believe the psychiatric evaluation is incomplete.

All this points up to the fact that, actually, we know little about make-up, perhaps even the mechanism, of the multiple reactor. We say, based on the work of Wedroff and Dogroff, Bloch, Sulzberger, and Rostenberg, that the eczematous sensitive individual may react easier to other eczematic agents.[5] Schwarz and Birmingham[6] do not believe this. However, only few patients with eczematous dermatitis even for prolonged periods develop into multiple reactors.

In brief, we believe that for therapy the factor of environmental change is the most important phase of the program. A multiple reactor as an in-patient on a Dermatology Service has relief from suspected or actual contactants in his job or in his home. In the hospital he has some relief from the psychosomatic factors with his dependency upon the hospital staff. He has opportunities for complete and thorough examinations that would not be possible for him as an out-patient or when seen casually by the in-

dustrial physician. A great factor in the in-patient care, we believe, is the opportunity to try to break up corticosteroid dependency which many of these patients have. This we are studying at the present time in a number of ways: by the usual gradual reduction of oral dosage, by the use of parenteral depot type of single dose of selected steroids at intervals, by the use of vigorous skin therapy to try to reduce the need for corticosteroids. It is our feeling also, that these patients should be discharged only after the skin has improved to a significant degree and when immediate relapse may not develop. Of course, it is also possible as an in-patient to have a more controlled therapy, topical and systemic. Moreover, also as an in-patient, we are able to set up much more easily some type of an attempt toward a prevention program.

Proposed In-Patient Study

It is obvious, then, from a review of the background of our meager data on the multiple reactor that most of our thoughts are pure speculations. There is need of research in this field. A practical program for research, in our belief, means study of the multiple reactor, first, as an in-patient. The patch testing should include not only the detailed review of the contactants in the job and home, but also the frequent repetition of these patch tests to see whether the same pattern of positive reaction holds. He should have tests also to try to determine toxic vulnerability of the skin, for example, by the alkali and the acid techniques.[7] By means of instrumentation, he could have tests done also by standard mechanical irritation of the skin. This we are attempting to work out with our Committee for Engineering in Medical Research. Preliminary studies have been done with spring-pressure traumatic pad. Light testing may be done by the carbon arc light testing technique by Jillson.[8] With our improved carbon arc apparatus, we have worked out a series of exposure values for various skin types.

Unless we do all these tests and unless we receive accurate details from history we are unable to delineate fully the degree of reactivity of the multiple reactor. Pharmacodynamic tests with histamine, nicotinic acid and its esters, acetylcholine may also be used. If the job type requires any vigorous type hand cleaning, controlled testing with various cleansers should be done. From the immunologic mechanism, the application of immunoelectrophoresis, the blood chemistry of electrolytes and corticosteroids may also be employed. The technique of immunoelectrophoresis has been studied in the Department and we plan to use this complex immunologic procedure to attempt to detect differences between the multiple reactor and the nonreactor. We realize that such precipitin complexes may not even exist in eczematous dermatitis. Yet, in addition to antihuman serums, we plan to study antigenic "complexes" with such agents as nickel, turpentine, chromates, etc.

The definition of the proteins of the multiple reactor by paper chromatography will provide data on the various regions of his serum proteins as compared with those of the nonreactor.

A detailed psychiatric analysis is also important. As indicated above, the psychiatric examination will include also a background social worker or family service study of his home and especially of his job. Psychiatrists with experience in occupational medicine are available at the College of Medicine, University of Cincinnati.

In this manner we would be able to get a detailed analysis of the multiple reactor. Perhaps, then, we could see what could be done to attempt to prevent the development of such a reaction, to determine why some patients with occupational dermatitis become multiple reactors and some do not.

Summary

There is too little appreciation of the clinical features, range of reactivity, and the severe economic losses of the multiple skin reactor in modern industry. A broad definition of the multiple reactor is given as an individual reacting widely to chemical agents, mechanical factors, physical agents such as radiation, and even to the social stimuli of his environment. The immunologic or reactive mechanism is not understood. An outline of a detailed in-patient study of the multiple reactor is presented as a complex investigative procedure to attempt to study this reaction in a more critical fashion.

References

1. Suskind, R. and Jambor, J. J.: An Etiologic Appraisal of Hand Dermatitis. *J. Invest. Dermat.* 24:379, 1955.
2. Goldman, L. and Preston, R. H.: Corticosteroid Therapy of Common Chronic Eczematous Hand Dermatitis. *G.P.* Sept., 1959.
3. Council on Industrial Health: Prevention and Control of Occupational Dermatoses. *J.A.M.A.* 169:1340, 1959.
4. Trasko, V.: Personal communication to the author.
5. Sulzberger, M.: *Dermatologic Allergy.* Chas. C. Thomas, Springfield, Ill., 1940.
6. Birmingham, D.: Personal communication to the author.
7. Engelhardt, A. W., Heite, H. J., and Jacken, H. P., Zur Bedeutung von Epicutantesten mit Saure und Alkali fur die Ekzemdiagnostik. *Arch. Klin. Exp. Derm.* 1958/4 323-338.
8. Jillson, O.: Personal communication to the author.

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Protecting the Health of Travelers

Protecting the health of personnel during work-related travel is one of the special responsibilities of the industrial physician. Formerly, as a rule, this involved only the occasional trip made by an executive to attend a convention or visit a trade fair. Recently, however, travel has become an increasingly necessary part of many positions in industry. This reflects in part the post-war expansion of foreign trade and the current trend toward diversification through mergers, cooperative ventures, and the formation of production or marketing pools. In addition, newer developments in science and technology have stimulated the growth of organizations providing specialized services or engaged exclusively in subcontracting whose executives and consultants have found travel increasingly obligatory. In many companies, there are now a number of individuals who spend virtually all of their time traveling: salesmen, auditors, purchasing agents, production coordinators, expediters, service and marketing consultants, and publicists. Also, more companies are sending whole contingents of their employees abroad for periods of weeks or months to work on particular production projects, a practice heretofore usually encountered only in the petroleum, mining, or construction industries.

The problems confronting the industrial physician concerned with the health of these travelers will obviously vary with such factors as the kind of work to be done, the places to be visited, and the duration of the trip. The preferences of the traveler and the prejudices of the physician will lead to additional variation. Nevertheless, these problems may be grouped into the following categories:

1. Selection of personnel
2. Planning the trip
3. Vaccinations and immunizations
4. Supplies of drugs and sundries
5. Medical care while abroad

In this paper, an approach toward their systematic solution will be discussed in the light of experience in the motion picture industry.

Travelers in the motion picture industry can be divided into those, usually involved in film production, who travel in groups, and those who travel individually. The former go "on location" in groups ranging from a "unit" of 10 or 12 persons to a "company" comprised of hundreds of men, women, and occasionally even children and animals. Their destination may be a city with all the accoutrements of modern urban civilization or, more often, a remote locale such as a desert, a tropical jungle, or a rugged mountainside where climate, terrain, and the lack of even primitive facilities may pose special problems. Protecting the health of these travelers may involve provisions for shelter, food and water supplies, and sanitation. It may require a well-equipped medical field unit and a professional staff and, frequently, is more of an exercise in logistics than preventive medicine. The detailed consideration of such complex problems is clearly beyond the scope of this paper. Instead, this discussion will be limited to those encountered with the person who travels alone.

The amount of travel by individuals in the film industry can be appreciated by recognizing that a substantial portion of the industry's product is imported or produced abroad, and that about half of its income is derived from sales in foreign markets. As in any highly competitive industry with substantial foreign interests, the management and coordination of a network of branch offices in virtually every major city around the world makes extensive travel obligatory for many individuals. This is complicated by the fact that films are essentially a perishable product purveyed in widely fluctuating and fundamentally unpredictable markets. Furthermore, the local success or failure of a particular film may be influenced, sometimes crucially, by the attitudes and prejudices of, or aroused by, those who made the film and those who sell, promote, or purchase it. These travelers, therefore, must frequently endure a climate of chronic urgency and recurrent crisis. Their journeys are often precipitate and hasty, being characterized

by "tight" schedules and days overcrowded with "important" appointments. Consequently, protecting their health becomes more difficult and, at the same time, more important for the success of their missions. In the following discussion, the problems involved in this endeavor are considered from the standpoint of a very common traveler, the person of executive rank who must spend a few days or a few weeks in one or more foreign industrial centers. With certain obvious exceptions, they will be equally applicable to similar travel within the United States and Canada.

Selection of Personnel

The knowledge that a job will require foreign travel should prompt the industrial physician to pay special attention to certain features of the applicant's health during the preplacement medical examination or when the individual participates in a program of periodic medical examinations. The outright medical rejection of an applicant is rarely necessary since, with modern methods of transportation, any individual capable of commuting between his home and the plant should be able to travel almost anywhere. However, his health may indicate limiting the amount or the conditions of his travel to an extent that might warrant assigning him to a different job.

Such a recommendation is based upon a number of practical considerations. The executive busy on a foreign assignment will frequently ignore early symptoms, hoping to complete his business and return home before allowing himself the luxury of being ill. This extra effort may precipitate a bout of illness that might have been averted by prompt medical attention.

While good medical care is almost always available in most foreign cities of size, it is sometimes difficult for the traveler to find it, especially when he is ill and unaccompanied. Language barriers, strange customs, and a relative lack of the modern appointments found in the hospital may create an undesirable psychological climate. There is also the adverse influence of separation from the members of his family; in some instances of serious or prolonged illness, this is obviated by sending the traveler's wife abroad at company expense to remain with him until he is able to be returned home.

The necessity of special arrangements and sometimes of accompanying attendants, nurses, or physicians may make the journey home far more costly than the one originally planned. In addition, another individual may have to be sent abroad to complete the assignment interrupted by the illness. It is obvious, therefore, that a disabling illness in an executive while traveling may be far more costly to him and to his company than the same illness occurring while he is at home. This has led a number of companies to establish the rule that none of their staff may journey abroad without the approval of the Medical Director based upon an examination conducted especially for this purpose.

Any acute or threatened illness of more than minimal severity will obviously demand postponement of the journey. Similarly, travel should be prohibited for individuals with certain chronic disorders (i.e., chronic cardiac or pulmonary disease, diabetes mellitus, chronic cholecystitis, peptic ulcer, or colitis) if they are to be exposed to conditions that will prevent adherence to their established maintenance regimens. One might also hesitate to allow a person with severe hay fever or allergic asthma to visit an area loaded with allergens or irritants to which he is known to be sensitive.

Certain less serious ailments also deserve consideration. For example, individuals with a chronic low back syndrome or a peripheral vascular disorder may suffer a recurrent attack following the many hours of uninterrupted sitting involved in a long plane, train, or motor car journey. Most modern hotels can supply the firm mattress or bed board needed by individuals with postural musculoskeletal derangements but, in some instances, they may have to sleep on the floor to avoid discomfort. Individuals with chronic rhinitis and sinusitis who travel by air require special precautions to assure patency of the air passages and avoid dysbarism (aerotitis media, barosinusitis, etc.). Finally, patients with a painful shoulder syndrome must avoid the necessity of carrying heavy parcels and luggage.

In addition to organic medical disorders, the industrial physician should be on the alert for psychological factors that might dictate limitation of travel. It is expected that the more blatant emotional and behavioral aberrations will be disclosed during the prehiring interviews or will be divulged when inquiries are directed to previous employers. On occasion, however, undesirable attitudes or habits that were concealed or may not have been a problem under the circumstances of the past employment may be detected in the course of a routine examination by a discerning physician. Alcoholism is a prime example. Another, much more subtle, is adherence to attitudes and prejudices that, notwithstanding their apparent acceptability in the person's home town, almost invariably provoke anger, resentment, and contempt among the people with whom he must deal in the course of his travels. Such an individual is scarcely likely to be a satisfactory representative for his company or, indeed, for this nation.

Planning the Trip

There are many instances in which special arrangements are required for a particular individual to travel with impunity. Since these require knowledge both of that person's difficulties and the problems likely to be presented by the conditions of the trip, close cooperation between the Medical Department and the Traffic Department or travel agency is essential. Arrangements for every phase of the journey should be made prior to departure, and someone in either department should be designated to be alert for unexpected developments that may require altering the original plans. Finally, the traveler should be given detailed written instructions including the names and locations of persons upon whom he may call for assistance.

Some problems are easily solved by airline personnel and travel agents, especially when they are notified in advance. For example, the usual long walk from the ticket counter to the plane can be obviated by the use of a special car, a mechanical cart or a wheel chair, and individuals unable to climb the boarding ramp can enter the plane via one of the lift platforms used for loading cargo. The travel agent can usually arrange to expedite any immigration and customs procedures to avoid the necessity of long standing and waiting in line.

Two factors frequently overlooked in planning a trip — perhaps because they are so obvious — that should receive the physician's attention are climate and time.

Climate, although often unpredictable, should be considered in deciding whether a trip should be made at a particular time. The physiologic effects of extremes of temperature and humidity have been the subject of much recent study and present obvious limitations to the travel of persons with chronic cardiac and pulmonary diseases. If travel is allowed, climate must be considered in advising what clothing to pack. A more extensive journey may require three complete sets of garments: one for a cold wintry region, one for a more temperate area and one adapted for tropical heat.

The second factor, time, reflects the speed of modern transportation and the tempo of current business affairs. The speedy passage of planes across time zones requires a rapid adjustment to a daily rhythm hours ahead or behind the one to which the traveler is accustomed. In either case, it may take several days for habits of sleep, digestion, and elimination to adjust to the change, a factor often neglected when the traveler plans his schedule.

A schedule that may have presented an easy program when first arranged frequently becomes overcrowded. Unexpected delays, missed appointments, and extra meetings seem almost inevitable. Then, there are the social functions: those of a business nature, and the dates for sightseeing, visiting, dinners and parties frequently urged with great pressure by well-intentioned friends and relatives. Finally, there is the collection of business and social chores that caused one seasoned traveler to complain, "I can handle all my regular business but the 'as long as's' break my back." He referred to the classic gambit, "As long as you're here, you ought to . . . ."

Proper planning can obviate some of these difficulties that otherwise can overwhelm even a healthy traveler. Allowing an extra day or two for the completion of the business, and interrupting a tight schedule with a stopover for several days of rest are two simple solutions.

Vaccinations and Immunizations

All travelers are required to have been successfully vaccinated against smallpox within the three years prior to their return to the United States. Additional immunizations are required depending upon the regulations of the countries through which they will pass and the diseases prevalent in these areas. Among these are yellow fever, cholera, plague, and typhus. Certain immunizations are not required but are recommended for all travelers: tetanus toxoid, influenza, poliomyelitis, and typhoid-paratyphoid. A booklet listing the immunizations required by each country is published by the United States Public Health Service* and should be consulted.

Active immunization against tetanus by two injections of alum-precipitated toxoid two to six weeks apart is a "must" for all travelers. A third injection at a similar interval is needed if fluid toxoid is used. A booster dose is given after one year and every four years thereafter, and is repeated in the event of any wound that may be contaminated by tetanus bacilli. This technique will give better protection than that afforded by the usual doses of tetanus antitoxin and will obviate the frequent and potentially serious reactions caused by that serum.

Annual immunization against influenza has been recommended by health authorities for certain groups of individuals who showed increased mortality and incidence of complications during recent epidemics. They include all individuals over 56 years of age, pregnant women, and persons of any age with cardiovascular disorders, chronic bronchopulmonary diseases, diabetes mellitus, Addison's disease, and other chronic debili-

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**Immunization Information for International Travel*, PHS Publication #384, Revised May 1960. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price 25 cents.

tating disorders. Because of the probability of encountering local epidemics of influenza, it is advisable for all travelers to be immunized with polyvalent influenza vaccine (two injections two or more months apart) and to receive a single booster dose annually.

Shortages of poliomyelitis vaccine originally made it necessary to limit its use to children and pregnant women, groups that were most susceptible to this disease. Now that this vaccine is in abundant supply, it is advisable that all travelers receive the recommended series of four injections: two separated by four to six weeks; a third, seven to 12 months later; and the fourth, one year after the third.

Doubts have been expressed recently about the protective value of typhoid-paratyphoid immunization, and this problem is currently being investigated by the World Health Organization. Most authorities, however, still recommend that travelers, particularly those going to places with uncertain sanitary facilities, receive a series of three typhoid-paratyphoid injections at seven-to-ten day intervals, followed by a single booster dose at intervals of one to four years.

The increasing prevalence of infectious hepatitis has led some physicians to recommend prophylactic doses of gamma globulin for all travelers. Uncertainty about the proper dose and the duration of the protection has led others to frown on its routine use. The large amount of fluid to be injected and the high cost of the usual dose also mitigate against its universal acceptance. Even those who do not advocate its routine use agree that gamma globulin should be given when the traveler is certain to be exposed to a local epidemic of this disease. An intramuscular injection of 0.05 or 0.06 cc. per pound of body weight should provide adequate protection for a period of six to eight months.

Ideally, immunizations should be given individually over a period of several months. Better antibody responses are generally obtained when vaccines are given singly with intervals of five or more days between each series of basic immunizations. Separating the injections also makes it possible to identify which of several vaccines may be causing reactions. Much too often, however, they are left to the last and the physician is required to administer all of the necessary inoculations within a two- to three-week period. Table I illustrates a typical schedule that may be employed. When necessary, it is possible to arrange for the traveler to complete the required series of injections while en route.

Reactions to the immunizations occur frequently but, for the most part, are of little consequence, being limited to the transient discomfort and swelling at the site of the injection.

TABLE I.
AN INOCULATION SCHEDULE FOR A FOREIGN TRAVELER

First Day	Typhoid-Paratyphoid Tetanus Toxoid (Alum precipitated)
Third Day	Influenza booster Smallpox Vaccination
Fifth Day	Cholera Inspect Vaccination
Seventh Day	Typhoid-Paratyphoid
Tenth Day	Yellow Fever
Twelfth Day	Cholera
Fourteenth Day	Typhoid-Paratyphoid Tetanus Toxoid

Occasionally, the local reactions may be more severe or there may be a systemic reaction consisting of malaise, generalized aching, and fever. As a rule, these reflect the intrinsic toxicity of the vaccine rather than an allergic reaction. They may be obviated by giving an intracutaneous injection of 0.1 cc. instead of the usual 0.5 or 1.0 cc. given subcutaneously or intramuscularly.

True allergic reactions may occur and may be quite serious but, fortunately, they are rare. In most instances, they are not due to the vaccine but represent a sensitivity to a constituent of its fluid vehicle. Small amounts of penicillin introduced as a preservative, residues of egg protein in vaccines cultivated in eggs, and animal protein in serum preparations are the most frequent offenders. It is imperative that the physician be fully acquainted with the contents of the vaccine he plans to use — the package insert provided by the manufacturer usually mentions all constituents that may cause allergic reactions — and make careful inquiries about the traveler's reactions to previous inoculations. When sensitivity is suspected, a reaction may be prevented by the use of a vaccine manufactured by a different process that obviates the presence of the potentially allergenic material.

Persons with a history of clinical allergies and proved multiple sensitivities should be given inoculations only with special caution. Even when previous inoculations have not been attended by reactions or, indeed, even when a vaccine is being given for the first time, an injection should be given only when several doses of epinephrine ready for immediate administration, tourniquets, and other emergency measures are at hand. The patient should be kept under observation for a period long enough to be reasonably certain that a reaction is not going to occur. Intracutaneous injections of well diluted test doses of the vaccine may help to identify those individuals more likely to have a serious reaction.

All immunizations are recorded on the certificate to be carried by the traveler, *and* in his

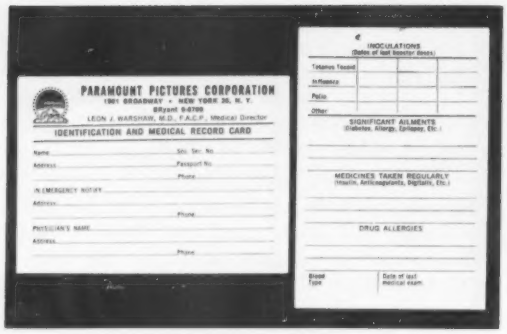

Figure 1
Sample of a wallet-sized card for identification and medical record.

chart in the medical department. The use of a separate, differently colored page for recording inoculations in the traveler's record makes it easy to check the need for booster doses at the time of his periodic examinations or other visits to the medical department.

The convenient International Certificate of Vaccination approved by the World Health Organization is most widely used; it can be obtained from the U. S. Government Printing Office* or from most travel agencies. Unless the physician is authorized by the U. S. Public Health Service to use the special "S-C" stamp, it is necessary to have the certificate validated by the local or state health department in the area in which he practices.

Each individual is also supplied with an identification and medical record card to be carried in his wallet (Figure 1). It provides for the recording of data that may be important in the event of an emergency in which he is unable to communicate. The listing of his personal physician and the company's Medical Director indicate sources of additional information about his medical background.

Drug Supplies for Travelers

The traveler who develops minor illness while in a strange country may have difficulty in procuring medications that will relieve his symptoms. Among the problems he may encounter are difficulty in finding a pharmacy that is open for business, the unfamiliar brand names for propietary medications, the language barrier between the traveler and the pharmacist, and, above all, lack of time. These difficulties can be obviated by supplying him with a kit containing small supplies of the medicines he is most likely to need (Figure 2). These, it should be emphasized, are not intended to encourage the practice of self-medication, especially for illnesses with serious potentialities. The traveler is cautioned verbally — and this is repeated in the instructions pasted into the kit — to consult a physician promptly for any illnesses characterized by unusual or severe symptoms, high fever, syncope, signs of bleeding, or for apparently minor illnesses that do not respond to the medications with reasonable speed.

The contents of the kit vary according to the predicted needs of the individual traveler. It contains adequate supplies of drugs previously prescribed for him as part of a treatment regimen for an established chronic or recurrent disorder. In addition, medications are included to provide symptomatic relief for the minor illnesses to which he is likely to succumb either because of his own particular susceptibility or the conditions under which he will travel: i.e., analgesics, antidiarrheal agents, antacids, anticholinergic compounds, antivertigo compounds, nasal decongestants, antihistamines, antibiotics, sedatives, and hypnotic agents.

It is manifestly impracticable, and unnecessary, to supply the traveler with every drug that he might have an occasion to use. Limitations of luggage space and weight necessitate pruning the list to a few essentials. Wherever possible, drugs are eliminated when similar effects can be provided by side actions of preparations included for a different primary indication. For example, certain antihistamine and antivertigo preparations may also be useful as sedatives or even as hypnotics.

Maximum effectiveness requires that the kits be checked regularly, ideally before and after each journey, to determine which drugs have been used, for what purpose, and with what

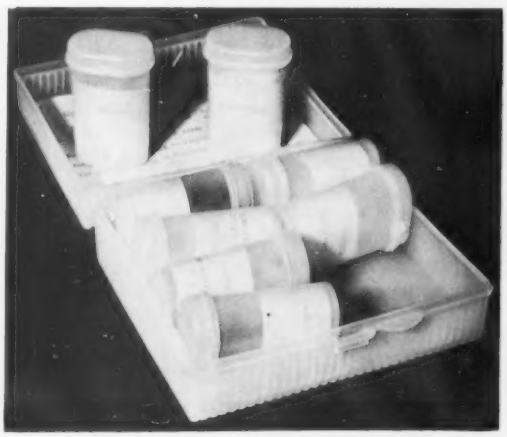

Figure 2
Sample of a personalized medication kit supplied to foreign travelers.

**International Certificate of Vaccination.* World Health Organization. For sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. Price 5¢ or $2.50 per hundred.

degree of effectiveness. Supplies of items found useful by the traveler can be replenished, while those that failed can be replaced by analogs likely to be more effective. In some instances, alteration of the recommended dose of a preparation may obviate its replacement. In addition, drugs may be changed when the prospective journey will take the traveler to regions quite different from those visited previously.

An analgesic is almost invariably included. For most individuals, aspirin, buffered aspirin, or one of the popular aspirin-acetophenetidin-caffein compounds suffices to relieve the occasional headache, musculoskeletal pain, or dysmenorrhea. When stronger analgesia is needed, dextropropoxyphene hydrochloride (Darvon®) has been useful. It is roughly equivalent to codeine in effectiveness and, since it is not a narcotic, may be transported freely.

For individuals subject to the painful shoulder syndrome or low back syndrome, muscle relaxants such as carisoprol (Soma®) or orphenadin citrate (Norflex®) are included. When inflammatory reactions are prominent in these syndromes, butazolidin may be added. The latter is also particularly useful for patients subject to gout or recurrent phlebitis.

Diarrhea and other gastrointestinal disorders are the bugbear of the traveler. Instances of amebiasis, bacillary dysentery or salmonella infection are occasionally encountered, and some cases are suggestive of enteropathic virus infection or staphylococcic food poisoning. In most cases of "tourists' disease," however, the etiology is obscure. It seems likely that many may be attributed to unfamiliar foods and condiments, to dietary indiscretions, or to the disruption of well established bowel habits. In any case, this disorder is usually self-limited and will respond to such simple measures as a bland diet, adequate fluid intake, and antidiarrheal preparations. Anti-infective agents such as arsenicals, halogenated quinolines, sulfonamides, and the antibiotics have been widely recommended not only in the treatment of this disorder but in its prophylaxis. However, they are of doubtful value and, since they are potentially harmful, their use should be reserved for cases in which a pathogen against which they are known to be effective has been identified.

Paregoric is effective in regulating this form of diarrhea but under the Narcotic Drugs Import and Export Act, no person, not even a physician, may lawfully take any narcotic drug in or out of the country without an official permit. Preparations of bismuth, kaolin, and pectin have been effective, but their weight and bulk and the danger of spilling have made them inconvenient, particularly for the traveler by air. These problems have been resolved by the appearance of polycarbophil-thihexinol-methylbromide (Sorboquel®). This tablet contains a hydrophilic colloid and an antimotility compound, and has been almost uniformly effective in the instances of diarrhea reported by travelers during the past year. Consequently, it is now included in every kit. The usual dose is two tablets followed by one tablet every two to four hours until the diarrhea and cramps subside.

Because it contains an anticholinergic agent, Sorboquel should not be used by persons with glaucoma or males with prostatism who are subject to acute urinary retention. Its anticholinergic action, however, has made it useful in individuals with dyspeptic symptoms. Several persons subject to repeated bouts of ulcer activity and to gall bladder attacks have used Sorboquel when awakened at night by their familiar symptoms and they found themselves without their usual medications. On each occasion, the symptoms subsided promptly and a typical disabling attack was apparently aborted.

Second to antidiarrheal drugs in the frequency of their use are preparations employed for respiratory infections. The more serious cases, i.e., those presenting chills and high fever, severe malaise or prostration, hemoptysis, pleuritic pain, or respiratory distress, obviously require a physician's attendance and perhaps even hospitalization. Fortunately, these are infrequent. Most of the respiratory infections encountered by travelers (the common cold, "la grippe," the "flu," or a "virus") are mild, self-limited and, when uncomplicated, require only symptomatic therapy. Since few travelers are likely to accept with equanimity the discomforts of the usual upper respiratory infection, some sort of "cold" preparation should be provided. An antihistamine, alone or in one of the popular combinations with aspirin and caffein, will usually ease an annoying rhinitis. An anticholinergic preparation will also be useful in this regard and, at the same time, will help to control the gastroenteric symptoms that frequently accompany these infections. Except for individuals with chronic pulmonary disorders, rheumatic heart disease, or other conditions in which secondary infection may initiate more serious difficulties, the use of antibiotics is unwise. They are rarely helpful and frequently engender side reactions that are more troublesome than the respiratory infection.

Those who cannot postpone plane travel until their respiratory infections subside are particularly prone to aerotitis, barosinusitis, and middle ear infections. Since the nasal congestion is likely to be enhanced by local irritation and by capillary dilatation, the use of tobacco and alcoholic beverages is interdicted. Antihistamines

and nasal decongestants, orally and by nasal spray, should be used freely before take-off and in flight. Treatment by a qualified otologist may be advisable if patency of the air passages cannot be achieved before departure, or if otalgia and loss of hearing cannot be relieved reasonably soon after landing.

A preparation to combat motion sickness may be required. Since the kits are usually packed away and inaccessible during flight, the traveler should be warned to carry this vial on his person. Airline stewardesses are frequently too preoccupied with their other duties to dispense medication, and their flight-kits may be depleted of this item. Consequently, those susceptible to airsickness should keep their own supply available. In addition to its specific action, a dose prior to departure will often provide sufficient sedation to allay the anxiety that appears to enhance the onset of motion sickness in many individuals.

A sedative or a hypnotic is frequently useful to combat "nervous tension" or when sleeping is made difficult by strange surroundings, time changes, or excitement. The antihistamine or antimotion preparations may have sufficient sedative effects to make it unnecessary to include a specific sedative or tranquilizer. As a hypnotic, a short-acting barbiturate such as secobarbital is less likely to produce the undesirable after-depression and "hang-over" than the preparations with more prolonged spans of action. In the last analysis, the choice of a particular drug, in this as in all other categories will depend upon the needs and the likes and dislikes of the traveler for whom the kit is being assembled.

In addition to medications, it may be well to provide the traveler with a small supply of adhesive bandages and some antiseptic-impregnated swabs for minor cuts and abrasions. For those going into tropical or semitropical areas, items such as a sun screening cream, an insect repellent and a fungistatic powder may be quite useful. Sunglasses should be prescribed not only in these regions, but also where there is much snow. A person who requires corrective lenses should carry an extra pair of glasses and a copy of his prescription to facilitate replacement.

Medical Attention While Abroad

There are occasions when the traveler may require a physician's attention. In most foreign cities of size, medical care of more than satisfactory caliber is usually readily available, but finding a physician in whom he may have confidence may be a formidable problem for the traveler who is ill. His basic suspicion of foreign physicians, bolstered by the recent publicity given to the relative inadequacy of their training, is coupled with a fear of misunderstanding due to language barriers. The traveler should, therefore, be advised how to procure medical services likely to be acceptable to him.

In some instances, it may be possible to give the traveler the names and addresses of foreign colleagues whose personality and skill have been verified through previous personal or professional contact. When this cannot be done and there are no local branch managers or agents to send him to a "good" physician, the traveler may be referred to the American Embassy or consulate, or to the local manager of a tourist service, an airline or travel agency. Many hotels have lists of English-speaking physicians who will respond to calls from their guests.

It is even more important to instruct the traveler when to call in a physician. Symptoms of mounting or unremitting intensity, those that recur frequently or fail to respond to simple measures, and particularly those that are likely to be complicated by further travel (i.e., the rhinitis and sinusitis that may set the stage for an aerotitis) should lead promptly to a call for a physician. When time permits, the traveler can be given any needed instructions or reassurance by an overseas telephone call or cablegram. This can also be used to convey to the foreign physician any pertinent information about the traveler's previous medical history and idiosyncrasies. In each instance, the foreign physician should be requested to provide a summary of his findings and the details of his treatment.

Summary

By the systematic consideration of the various items discussed above and by adjusting them to the individual requirements of the traveler and the particular places he will visit, the physician will do much to keep the traveler's journey and the duties he is to perform from being delayed or disrupted by illness. However, a boatload of medicines and supplies will not suffice to protect the health of the person who is unwilling to use them. This is the physician's most important contribution: To indoctrinate the traveler with the importance of simple preventive measures and to persuade him to use common sense in applying them. The rules of moderation and the avoidance of overindulgence he practices at home become even more valuable when under the stress of foreign travel. With the guidance of the physician, he should be able to steer a safe course between the Scylla of the pill-swallowing, pulse-taking hypochondriac and the Charybdis of the ostrich-like braggart who avoids illness merely by refusing to look at it. In this way, the health of the traveler will be protected — at home as well as abroad — and the success of his mission made more likely.

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ALCOHOLISM:
diagnostic considerations

Although alcoholism is acknowledged to be a major medical and public health problem, the difficulty entailed in detecting the alcoholic has not been widely appreciated. Granted that the diagnosis can sometimes be made with ease, it nevertheless can be quite elusive.

It is important to realize that most alcoholics who consult their physicians do so for reasons other than their alcoholism.[1] Although their complaints are often related directly or indirectly to their drinking problem, this relationship is usually not apparent. Hence, establishing a diagnosis of alcoholism is essential if the physician is to understand his patient — and the patient's complaints. It may also clarify many of the illnesses and complaints of the alcoholic's long-suffering family.

The diagnosis of alcoholism can only be made by adequate history taking — which will only be as diagnostic as the skill, training, and thoughtfulness of the historian permits. Although a number of somewhat different definitions of alcoholism have been proposed, that recently advanced by Keller[2] appears most appropriate: "Alcoholism is a chronic disease manifested by repeated implicative (suspicion-arousing) or marked drinking so as to cause injury to the drinker's (mental or physical) health, or to his social or economic functioning."

Factors Obscuring Diagnosis

The Stereotype: In the past alcoholism and the skid row stereotype were indivisible in the public mind. Anyone who did not fulfill the description of a drunken derelict was not seriously considered as possibly alcohol addicted. It has been difficult to accept the idea that alcoholism is found in all socio-economic groups and not infrequently afflicts accomplished and outstanding individuals. Most alcoholics are respectable citizens living quietly in our communities, their alcoholism unknown to us.

Concealment: Coupled with the stereotype misconception is the alcoholic's skill at camouflaging his chronic or recurrent inebriety so that he remains indistinguishable from his fellow citizens.[3] In appearance and deportment he is at pains not to betray himself. Through the early years of his illness he manages to hold a job and can usually keep his social and economic life from deteriorating. In general the alcoholic is not readily recognized as such by the casual observer, or even by his next door neighbor.

Denial: The alcoholic's physical and psychological concealment of his alcoholism is often powerfully abetted by his own failure to realize that he is alcoholic. Many a confirmed alcoholic is genuinely taken aback when confronted with the possibility that he is alcoholic. Over the years he may develop a host of logical arguments to prove that he can "take it or leave it." Moore and Murphy have emphasized that the alcoholic's denial of his drinking problem is unconscious and stems from his desperate need to seek escape through intoxication.[4] The alcoholic perceives life without alcohol as empty, futile, and constantly threatening. As long as he can remain convinced that he does not really need alcohol, the alcoholic can feel that he does not have to give it up. This denial is not merely obstinate lying but an essentially unconscious mechanism used to protect what the alcoholic feels are life-giving supplies. Since the alcoholic has already deceived himself, it is not surprising that his denial may be intense and convincing enough to beguile the unwary physician.

Unfortunately the alcoholic's "denial" is sometimes potentiated by the physician's use of a similar mechanism. Early in his career the medical practitioner learns that alcoholism bears a dubious prognosis. He hears or discovers that alcoholic patients are unpredictable and frustrating and he finds that alcoholism itself is a uniquely evasive clinical phenomenon without a

common etiology or accepted method of management.[5] He may realize that the alcoholic is not always a gratifying patient with whom to work. Under these circumstances, the physician may understandably be loath to discover that one of his patients is alcoholic and may tend to overlook or minimize the patient's drinking problem by ascribing symptomatology to causes other than alcoholism. Thus, the physician's "denial" enables the patient to postpone further the realization that he is ill.

Psychiatrists, psychiatric social workers, and others trained to work with the emotionally ill may also inadvertently contribute to the perpetuation of the alcoholic's drinking problem. This may develop as a result of the therapist's underemphasizing or ignoring the drinking problem itself in order to concentrate on the "underlying problem." Although this is the preferred technique in dealing with most emotional disorders, it is frequently capitalized upon by the alcoholic to confirm the insignificance of his drinking. Markeham[6] has succinctly summarized this problem: "Failure (of the physician) to recognize, perhaps even to admit, that excessive drinking is relative and crucial to a person's illness or maladjustment is generally recognized as a major barrier to treatment." He describes a case history of an emotionally disturbed woman demonstrating how little change was wrought in the patient until her alcoholism had been brought into the open and dealt with. Very little change will occur in the troubled emotional and mental life of the alcoholic patient, regardless of diagnosis, until the problem drinking itself is also brought into focus.

The "Variable" Addiction: One possibly misleading aspect of alcoholism is its dissimilarity from other drug addictions. The narcotic or barbiturate addict must dose himself at least a few times daily; he cannot go more than several hours without telltale withdrawal signs. This is not true of many alcoholics who may habitually "rest" anywhere from days to weeks between drinking bouts. If these alcoholics are interrogated about their drinking, they quickly point to the fact that they have not had a drink for several days or weeks. (Most alcoholics do imbibe daily, although the quantity consumed will vary with environmental considerations related to their type of employment, availability of funds, and proximity to the weekend.) This is a marked contrast to the narcotic addict who is more dramatically enslaved by his addiction and cannot vary the temporal aspects of his addictive need. The physician should not be lulled into overlooking the more flexible addiction of certain alcoholics.

Beer: Herein lies another pitfall for the uninformed diagnostician. Many an alcoholic will emphasize his denial by pointing out that "All I drink is beer." This should not throw us off the track. In spite of its low alcohol content, individuals may become and remain alcoholic on beer alone.[7] The alcohol content of beer is sufficient to build up gratifying blood alcohol concentrations, depress cortical centers, and remove inhibitions.[8]

Women: If it is difficult to make a diagnosis of alcoholism in a male patient, it is infinitely more difficult to elicit the necessary information from or about a woman so afflicted. Social and economic factors enable the woman alcoholic to cover up her drinking problem more effectively than does her male counterpart, and it is these same factors which prevent her from seeking professional help. As a homemaker, particularly after her children are in school, she has no rigid vocational schedule to meet and this may result in less restraint toward drinking and less pressure to do something about it. On the other hand, the family will resort to myriads of useless nostrums and appeals over a period of many years rather than seek professional help because they are ashamed to have "mother" labeled an "alcoholic." Hence, most of us rarely see or hear of alcoholism in women and it is a diagnosis seldom thought of when dealing with the fair sex. The actual ratio of women to men alcoholics is enigmatic. Although all agree they are not as multitudinous as male alcoholics, women alcoholics are undoubtedly present in significant numbers.[9]

Diagnostic Criteria

In his classic paper, Jellinek described 43 signs and symptoms of alcoholism.[10] The discussion that follows will be limited to those stigmata of alcoholism that are most easily elicited during an anamnesis and those most likely to be brought to the physician's attention by the patient or others. Although no single symptom is sufficient to establish a diagnosis, the presence of any of the following should serve to raise the physician's level of suspicion.

Blackouts: This is a classic symptom consisting of a period of amnesia which begins during an alcoholic bout. Typically, the individual arises the following morning totally unable to recall his activities or whereabouts for all or part of the previous evening and night. The amnesia for for that period is permanent. It is important to emphasize that the alcoholic was completely conscious during the period he later is unable to recall. Amnesia does not occur in quite this way in any other illness. Although it is conceivable that a nonalcoholic may experience blackouts while drinking, it is uncommon.

Craving (Loss of Control): This refers to a phenomenon in which the individual is unable to refrain from more drinking once he has imbibed a small quantity of alcohol. The intake of alcohol seems to result in an irresistible need for more and more alcohol. Unfortunately most alcoholics never lose this "craving" even after years of abstinence and can never safely return to social drinking. It has never been satisfactorily established whether "craving" is primarily physiological or psychological.

The Sick Hang-Over: It is regrettable that custom dictates the term "hang-over" here since it bears little resemblance to the ordinary hang-over experienced by the nonalcoholic after a night "on the town." The alcoholic's hang-over is characterized by intense emotional and physical pain and suffering. Even those alcoholic patients who steadfastly deny a drinking problem may be eager to describe the horror of the "morning after." Recently one such patient, after vainly trying to find words to describe how he felt when in the throes of a hang-over, threw up his hands and exclaimed, "It's a nightmare — you couldn't understand." The hang-over of the alcoholic is really a drug-withdrawal phenomenon and is most severe following prolonged drinking bouts. As with any withdrawal syndrome, the subject may learn that the withdrawn drug will relieve his suffering more quickly than anything else. Hence, a history of morning drinking may be obtained in the alcoholic. However, many alcoholics do not indulge in morning drinking and others will deny it even though they do because they realize that to admit morning drinking is tantamount to a confession of their alcoholism. Hence failure to elicit a history of morning drinking is of no great significance.

(Another alleged sign of alcoholism that is of little use is "solitary drinking." Most alcoholics are surprisingly gregarious; they do not like being alone and will not drink alone if they can help it. They will often wend their weary way long distances in order to enjoy the company of drinking companions.)

Automobile Accidents: The association between drinking drivers and motor vehicle accidents has been known for many years. Interestingly enough, the alcoholic was never considered as being potentially dangerous in this regard. It was repeatedly emphasized that the real traffic menace was the casual drinker rather than the alcoholic. The alcoholic was depicted as being either too sly or too drunk to drive. However the recent work of several investigators casts considerable doubt on these previously held ideas.[11,12,13,14] It appears that many alcoholics become involved in a large number of automobile accidents or are repeatedly apprehended for moving traffic violations, often of a serious nature. Not infrequently, the violations offer no clue to the important role played by the driver's inebriety. (Driving while intoxicated is a serious charge, usually a felony, and conviction is difficult to obtain. Reckless driving and speeding offer no such problem.)

Detailed questioning regarding past automobile accidents and moving traffic violations should be undertaken where alcoholism is suspected, particularly when the patient has had "a few drinks" prior to many of the violations and accidents. A number of accidents or serious violations of traffic laws may denote the presence of alcoholism.

Absenteeism: The alcoholic may occasionally be either too intoxicated or too ill from his withdrawal hang-over to work. However, flagrant absenteeism is usually a very late manifestation of alcoholism; during the early years of his illness the alcoholic usually manages to maintain a good attendance record, missing no more than 10 to 15 work days a year. (After arriving at the job, however, he may be unable to do very much except pretend that he is working.)

The alcoholic who occasionally needs time to recover from the after-effects of a binge realizes that suspicion may fall on him for his absenteeism. Hence he will often develop clever subterfuges to account for his periodic absences, and this may involve using a physician. He may show up in the physician's office a few times a year complaining of a "cold," "the flu," "arthritis," "back pain," or some other ill-defined complaint that began a few days before. He eagerly accepts treatment and invariably requests a letter from the doctor to his employer explaining that his illness prevented his working. He will explain to the physician that he had been ill three or four days prior to his seeing the physician, and would the physician please indicate that he was ill for that entire period? Sometimes the alcoholic will use several physicians in order not to arouse their suspicion; however, he then runs the risk of having his employer wonder why each note is from a different M.D.

The Family: The alcoholic's drinking problem may be successfully concealed from the outside world but never from members of his immediate family who bear the brunt of his illness. In those cases where the physician cannot determine if his patient is alcoholic, frank interviews with the patient's spouse, parents, siblings, or children will often yield the necessary corroboration. If any group can be said to live lives of quiet desperation, it is those who live under the same roof as the alcoholic. Pride or fear of reprisal

may make it difficult for the family to divulge their burdensome secret. In most instances, however, they will cooperate in any effort that promises to result in alleviating their common misery.

Comment

As the concept of alcoholism as an illness gains greater public acceptance, it becomes increasingly important for the medical profession to be aware of those factors within themselves and their patients that mitigate against correctly diagnosing this ancient malady. Obviously, no successful rehabilitative efforts can be initiated until the physician — and the alcoholic — realize they are contending with a serious problem. The economic and human cost of alcoholism is incalculable and its low grade malignancy still not widely appreciated.[7,15] Whether the physician undertakes to treat the alcoholic himself or refers him elsewhere, physicians constitute one of the most important and sensitive case-finding facilities in the fight against alcoholism.

Summary

Establishing a diagnosis of alcoholism is not the simple task it is purported to be. Considerable ingenuity as well as a high level of suspicion are required, since the diagnosis is made primarily by anamnesis. Obstacles include the nature of the syndrome itself, the patient's conscious and unconscious evasion, and the physician's attitude toward drinking and alcoholism. Illusory factors include public misconception regarding alcoholism as confined to a skid row stereotype, the alcoholic's ability to cover up his excessive drinking, and his use of the psychological mechanism of denial. The physician's attitude may cause him to assist the patient in his denial; he may eschew asking certain questions in order to avoid discovering that he is dealing with a syndrome for which he does not have all the answers.

Mental health workers may also unwittingly strengthen the alcoholic's denial by concentrating exclusively on underlying problems while either ignoring all aspects of the drinking itself or never taking a case history that is thorough enough to disclose that the patient is alcoholic. The usual outcome of this approach is that the patient experiences no improvement whatever.

The interviewer may be deceived by a number of factors, all of which may be exploited by the alcoholic to prove that he is not alcoholic. Among these are the variable addictive need of the alcoholic as contrasted to the more compelling dosage requirement of the narcotic addict, and the fact that an individual can become and remain alcoholic on beer alone. Although alcoholism is not uncommon in women, the diagnosis is often missed because one generally does not associate alcoholism with the gentler sex.

The most constant and most readily elicited symptoms of alcoholism are blackouts, loss of control over drinking, the sick hang-over, and frequent automobile accidents or moving traffic violations. Since the covert alcoholic may consult his physician frequently, alcoholism is a group of diseases that the physician struggles with more often than he realizes. The correct diagnosis may clarify many aspects of the past and present medical history of both the patient and his family.

Although the treatment of alcoholism still leaves much to be desired, it should not serve as an excuse for failure to establish proper diagnosis. Treatment techniques are constantly changing, but diagnostic skill remains the hallmark of the vigilant physician.

References

1. Riley, J. and Nardin, C.: The Medical Profession and the Problem of Alcoholism. *Quart. J. Stud. Alc.* 7:240, 1946.
2. Keller, M.: Definition of Alcoholism. *Quart. J. Stud. Alc.* 21:125, 1960.
3. Selzer, M.: Alcoholism and the Law. *Mich. Law Rev.* 56: 237, 1957.
4. Moore, R. and Murphy, T.: Denial of Alcoholism as an Obstacle to Recovery. *Quart. J. Stud. Alc.* (To be published).
5. Strauss, R.: Medical Practice and the Alcoholic. *Ann. Amer. Acad. Pol. Soc. Sci.* 315:40, 1958.
6. Markeham, J.: The Case of Mary Doe. *Ann. Amer. Acad. Pol. Soc. Sci.* 315:82, 1958.
7. Selzer, M. and Holloway, W.: A Follow-up of Alcoholics Committed to a State Hospital. *Quart. J. Stud. Alc.* 18: 98, 1957.
8. Lolli, G., Schesler, E., and Golder, G.: Choice of Alcoholic Beverage among 105 Alcoholics in New York. *Quart. J. Stud. Alc.* 21:475, 1960.
9. Keller, M. and Efron, V.: The Rate of Alcoholism in the U.S.A. *Quart. J. Stud. Alc.* 19:316, 1958.
10. Jellinek, E.: Phases of Alcohol Addiction. *Quart. J. Stud. Alc.* 13:673, 1952.
11. Goldberg, L.: Druken Drivers in Sweden. Proceedings of the Second International Conference on Alcohol and Road Traffic. Toronto; Alcoholism Research Foundation, 1955.
12. Schmidt, W., and Smart, R.: Alcoholics, Drinking and Traffic Accidents. *Quart. J. Stud. Alc.* 20:631, 1959.
13. Wilbar, C.: Crash Assignment. Traffic Accidents Scrutinized by the Pennsylvania Department of Health. *Am. J. Pub. H.* 50:1349, 1960.
14. Selzer, M.: Personality Versus Intoxication as Critical Factor in Accidents Caused by Alcoholic Drivers. *J. Nerv. Ment. Dis.* 132:298, 1961.
15. Jellinek, E.: "Death from Alcoholism" in the United States in 1940. *Quart. J. Stud. Alc.* 3:465, 1942.

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Psychological Testing Concepts For the Industrial Physician

As a member of the executive staff of the business and industrial firm, the industrial physician will want to be "knowledgeable" about the proper uses and the limitations of psychological testing. There are at least five possible reasons for his interest: (1) he frequently reports to the personnel and industrial relations director under whom the testing function is likely to be located; (2) the industrial physician is sometimes interested in assuming responsibilities beyond the scope of the medical department, which could include the employment and testing functions; (3) he sometimes calls on the psychologist for diagnostic testing in his medical practice; (4) as a scientist he is vitally concerned with the scientific selection of people; (5) he may very well be on the receiving end of employee complaints of alleged test misuse. Each is a sufficient reason for interest. Curiosity alone would suffice.

Testing Under Attack

There seems to be a renewed interest in criticizing psychological testing. Two examples of highly critical writings in diverse kinds of publications are the following: "The Brain-pickers Can Cost You Your Job," by Martin Gross, in a 1959 issue of *True Magazine;* and "The Fallacies of Personality Testing," by William H. Whyte, Jr. in *Fortune,* September, 1954. The criticisms of these authors seem to center around the problem of validity and around matters of ethics, including the problem of invasion of privacy. Some of their criticisms have merit and some do not, but the fact these articles were published and quoted extensively indicate a problem. Either tests are being misused badly, or there is a great deal of misunderstanding about the use of psychological tests. Or perhaps authors and the public thrive on "sensationalism." There may be an element of truth in all three suppositions.

It should be pointed out that criticism of psychological testing is not new. Psychological testing has been a controversial subject for at least 50 years. For example, in 1911, C. S. Myers wrote an article entitled, "The Pitfalls of 'Mental' Tests."[1]

The annotated bibliography in a 1919 book entitled *Hiring the Worker* described Hugo Munsterberg's 1913 book, *Psychology and Industrial Efficiency,*[2] in the following way:

> This book sets forth certain laboratory experiments which attempt to link psychology to industry. So far as the present work of the counselor or employment manager is concerned it has no practical bearings. Though Professor Munsterberg states in the introduction that "Completed investigations do not as yet exist in this field," the general tone of the book or the hoped for short-cut methods in hiring men has lead many persons to believe that some progress towards discovering aptitudes through psychological experiments and tests has been made. The tests described in this book are supposed to reveal qualities, and it is naively assumed that these qualities shown in the laboratory will operate in the complex situations of life. There seems to be no proved relationship between laboratory tests and experiences in the occupations.[3]

Thirty-five years later Whyte's *Fortune* article had an even less moderate tone. One would think that after all these years the state of the art would be such that a magazine of the stature of *Fortune* would not find it profitable to publish an article so critical of testing. But such is not the case.

Popular writers are not the only ones who are interested in criticizing testing. Labor unions are beginning to question the validity of testing practices, are filing grievances in this connection, are taking cases to arbitration, and in at

Many of the concepts and opinions expressed in this article are expanded and revised from an article by the same author in the February, 1961, issue of the *Personnel Journal,* entitled "What Every Executive Should Know About Psychological Testing." The author is indebted to the editor of the Journal for permission to make extensive use of the earlier material.

least two recent instances have won their cases. For example, in the case of a steel company, an arbitrator handed down a decision stating that the tests used by management to measure employees' ability to perform the work of posted jobs were not appropriate to the jobs in question.[4]

In another case concerning a hardware company, an arbitrator ruled that a test was invalid in that it should not be used to "predict job performance with reasonable accuracy."[5]

In still another case, an arbitrator held that, when challenged through the grievance procedure, management was obliged to disclose the method of test administration and to demonstrate the validity of tests used in making promotions.[6]

Uses of Tests in Business and Industry

Tests are used in business and industry for five primary purposes: (1) the selection of new employees (this is the most extensive use); (2) appraising employees for promotion potential; (3) counseling employees, particularly managers, as a part of a management development program; (4) as part of a confidential counseling service; (5) for medical diagnosis purposes. If properly used, psychological tests can make useful contributions in all five functions.

Psychological tests can be categorized in various ways. One useful grouping is into five categories: Personality, Interest, Aptitude, Achievement (or Knowledge) and Mental Ability (or Intelligence). There is considerable overlapping between these categories, however. For example, interest tests can be considered personality tests, and mental ability tests can be thought of as types of aptitude tests. In addition, some personality tests are used partly to diagnose personality dynamics, and there is probably considerable achievement and knowledge represented in an intelligence test score. But for convenience, some classification system such as the above is useful.

Some examples of personality tests are the Guilford-Martin Personnel Inventory, The Berneuter Personality Inventory, The Bell Adjustment Inventory, The Minnesota Multiphasic Personality Inventory, the Rorschach (Ink Blot Test) and the Thematic Apperception Test. The latter two personality tests are called "projective tests" because the person taking the test projects his personality into what he sees in the test. In the case of the Rorschach, he is looking at an ink blot; in the case of the TAT, he is looking at a picture about which he tells a story.

Examples of interest tests are the Strong Vocational Interest Blank and the Kuder Preference Record. The Strong compares a person's interest with the expressed interests of people in various occupations. Both tests focus on likes and dislikes.

There are numerous aptitude tests. (Aptitude can be defined as potential ability — the extent to which a person has talents that can be developed.) Examples of aptitude tests are the General Clerical Tests, The Flanagan Aptitude Classification Test, The Scholastic Aptitude Test, and the McQuarrie Test for Mechanical Ability.

Examples of achievement tests are the Bennett Test for Mechanical Comprehension, The Mathematical Attainment Test, and spelling and vocabulary tests. Achievement or knowledge tests are probably the least sophisticated of the five categories which we have mentioned.

Intelligence or mental ability tests include the Stanford-Binet, The Ohio State Psychological Examination, The Otis Mental Ability, and the Wonderlic Personnel Test.

The Validity Problem

The most common mistake in the use of psychological tests in industry is not validating a test for a particular situation. Validity is the extent to which a test predicts a criterion. (A popular definition of validity is the extent to which a test measures what it is supposed to measure.) The criterion is a measure of some degree of performance. Ordinarily in industrial testing, validity means the extent to which a test will predict some criterion of "success." The most common mistake, then, is the use of tests without knowledge of how accurately the test predicts behavior.

Far too often tests are used in business and industry without any knowledge of what the tests actually predict in the situation in which they are used. Assumptions are made about what the tests are doing, but there is no attempt to verify the assumptions. Sometimes tests are used which have been validated in other situations, but unless the organization using the test is very confident that its situation is similar, no one can be sure what the test is measuring. Even if the situations appear very similar, there can be considerable doubt.

A big problem in connection with validity is the problem of the criterion problem. That is, what is meant by success, if success is what we want to predict? We immediately run into many problems.

For example, if we want to decide on a criterion of success as a salesman, should we use gross sales per year, number of new customers per year, or should we use net profit on the items that were sold? If we use gross sales per year, should we not also take into account type of territory, previous sales effort, size of territory, the kind of customers located in this area, etc.? If we

use success ratings by supervisors as a criterion of success, are the ratings of the various supervisors comparable or does one rate his subordinates high and the other one rate his subordinates low? Does one supervisor know the person in question better than other supervisors rating that person? All of these are problems in determining an appropriate criterion of success.

Determining an appropriate criterion is probably the most difficult problem in testing; it is probably the step most often not done at all, and it is one of the first things that should be done.

The reader may have noticed that one research study will show that a test will do a good job of predicting in one situation, but that another study shows that the test does a poor job in another situation. The reason for this can often be that the criteria of success were quite different in the two different situations. Obviously if the criteria are different, the validity is going to be different.

Little attention has been given to standardizing criteria of success from one organization to another. Most of the standardization that has been done has been on the test themselves. Perhaps standardizing criteria is not feasible. On the other hand, significant gains may be made by using subcriteria — that is, agreeing on success standards for certain aspects of a certain kind of job in a number of organizations. For example, it may be more feasible to develop a measure of sales manager success in obtaining subordinate cooperation than it is to obtain a measure of over-all success as a sales manager.

A Validation Procedure

For illustration purposes, the following overly-simplified example of the statistical validation of a test is shown. Suppose we wish to find a test which will predict success as a foreman in a manufacturing plant. First of all, we must determine what is meant by success. That is, we must develop some yardstick or measure of success, a "criterion." We might decide to use superintendent and general foreman ratings; we might look at the number of grievances emerging in each department per year; we might look at savings realized because of reduced scrap; we might look at the number of suggestions emerging from employees, or we might look at other factors or a combination of factors. For our example, we will arbitrarily select the number of units per year manufactured in the department supervised by these foremen. Obviously there will be some problems of respect to this kind of a criterion.

Our next task is to look for a test that looks as if it might possibly predict our criterion. Suppose we have observed that the foremen whose production records are the best seem to be the "brightest." We decide, therefore, to see if a mental ability test will predict success as a foreman — i.e., success as we have defined it, namely the number of units produced per year.

The next four vacancies for the position of foreman are filled in the traditional way. Four men are promoted to the job as foreman and are simultaneously given mental ability tests. These test results are filed away, and a year later we pull out the test scores to see if they are related to the first year's production record. (Four cases is a ridiculously small number, but for simplicity in our problem we will use only four. As a "rule of thumb," fifty cases is usually considered a minimum number to provide a reasonable degree of stability in our statistics.)

Comparing mental ability scores with the production record we find the following:

Foreman	Mental Ability Score	Units the First Year
1	110	350,000
2	140	410,000
3	135	320,000
4	120	400,000

Using a rank order correlation formula, we find a correlation coefficient of .40. This can be roughly interpreted to mean that 16% (the .40 is squared) of the first year's success as a foreman appears to be related to the mental ability score. We cannot be sure that there is a cause and effect relationship, however. We can only use our best judgment to decide there probably is a cause and effect relationship.

To interpret our statistics in another way, roughly 84% of what seems to make for success as a foreman is not accounted for. As a consequence, we will probably reject the use of this test because there is too much room for error. However, if we have a large number of applicants and can afford to reject many who would succeed, we might improve our batting average by using this mental ability test.

It might be that additional tests and the combination of scores using multiple correlation techniques to predict success will improve our correlation coefficient. However, we have no way of knowing until we run another validation study, this time with more predictor variables (more tests).

The Reliability Problem

Reliability is another problem in the use of psychological tests and is closely related to the matter of validity. Reliability is the extent to which tests results are consistent. In test development, there have been the three traditional ways to determine some indication of reliability:

(1) the repeat method (giving the same test again); (2) the alternate form method (giving a second form of the test to see if similar results are obtained); (3) the split-half method (dividing the test into two parts). In each method, a correlation coefficient is computed to determine the degree of consistency.

The physician is aware of the importance of reliability. Certainly any instrument used in measuring blood pressure which gives erratic and unpredictable readings is not going to be a useful device in predicting patient health. Unless the instrument consistently measures the same thing and obtains the same results the validity is bound to be low.

Statistical Versus Clinical Validation

The reader will note that in all of our discussion of validity and reliability, we are talking about statistical validity and reliability which involve measurements on groups of people. In statistical validation, test scores are related to criterion scores with the use of mathematics, and the validity measure is reported in the form of a statistical correlation. As we have mentioned, correlations are also computed in determining reliability.

There is another kind of validation, however, that we might call "clinical" validation. This is a concept with which the industrial physician again will be very familiar. In its clinical validation of a psychological test, a psychologist has used a test enough and has observed what it means in terms of behavior on the job and life in general to be able to predict fairly accurately what behavior the client will manifest. In conjunction with other information, the psychologist feels fairly confident that he knows what the test scores mean in terms of probable performance in the future. This we can call "clinical" validation. We hasten to say, however, that the wise psychologist will keep track of his "batting average" so that he will have a check on his assumptions about predictability.

The physician has experienced this kind of validation many times. He has seen so many patients over the years with similar symptoms that he can predict fairly confidently what is likely to occur in the future. Actually, any treatment which he prescribes is based on his prediction of future events.

The relative accuracy of statistical versus clinical validation has been thoroughly discussed in a book entitled *The Clinical Versus the Statistical* by Paul Meehl.[7] Meehl finds that statistical prediction appears to be the most accurate and he concludes by saying, "Always the actuary will have the final word."

In the opinion of the present writer, both types of validation are defensible in the use of psychological tests, but in the absence of strong reasons prohibiting it, statistical validation should be undertaken. In my opinion, under no circumstances should a nonprofessional presume himself competent enough to assume his own clinical validation in the use of psychological tests.

Who is Qualified to Use Psychological Tests?

It is important to distinguish between test administration and test interpretation in determining who is qualified to use psychological tests. Ordinarily, administration does not require as high a degree of qualifications as does interpretation. However, there are some tests that should be administered only by a qualified psychologist. It is also obvious that the more complicated the test the more training should be given to those who will administer it.

Test interpretation generally calls for a much higher order of training and competence. There are some tests that might be interpreted by anyone having had only one college course in test and measurements (with the appropriate prerequisites). No doubt there are a large number of the home-grown variety of work-sample tests which almost any reasonably intelligent and mature person can interpret. Under no circumstances, however, should certain tests be interpreted other than by a qualified psychologist who has had considerable training in the use of specific tests. The Rorschach, The Minnesota Multiphasic Personality Inventory, and the TAT are examples of tests which should be used only by psychologists trained in their use.

How To Locate and Select Consulting Psychologists To Assist in Testing

There are several sources of information that the executive can utilize in the location, selection, and evaluation of those offering psychological services. The *Directory of the American Psychological Association* is a logical place to start.* This directory lists members of the Association, and, although membership does not necessarily certify a degree of competence, it does indicate that the person has had considerable background and training in the field of psychology. In addition, the Directory indicates fields of interest and research, state certification, and diplomate status. (Diplomate status is a definite endorsement of outstanding qualifications.)

Another source is the *Directory of American Psychological Services*. This directory lists organizations offering psychological services that

*American Psychological Association, 1333 Sixteenth Street, N.W., Washington 6, D.C.

have been approved by the American Board for Psychological Services.* Unfortunately, many qualified psychologists and consulting firms are not listed in this directory because they have not made application for review by the Board.

Also, there is the *Directory of Vocational Counseling Services* published by the American Board on Professional Standards in Vocational Counseling, Inc. A companion directory is the *Directory of Vocational Members, National Vocational Guidance Association.*** People listed here may or may not have as much training in psychology as the people listed in the *Directory of the American Psychological Association*, but the chances are good that the people listed have had considerable professional training. There are no doubt some who are listed in several of these directories, including multiple membership.

Another source would be the directory issued by any state board or organization concerned with the certification of psychologists in that state. The majority of states, however, do not yet have certification laws, and thus there will be no such directory in these states. (The physician will be interested to know that there were only 17 states and two municipalities where psychologists were certified or licensed by either the state or the professional association as of 1957.[8] One consequence of this is that the psychologist has insufficient protection against unethical and unprofessional competition, and the public is similarly vulnerable to the activities of quacks and "con" men.)

Additional sources of help are university psychology departments and professors in the field of personnel management in business schools. Both are usually in a position to recommend qualified psychologists; in many instances such faculty members do a certain amount of industrial testing work on a consulting basis. Inquiring about degrees held, courses taken, and institutions attended are other ways of evaluating psychological consultants, and the recommendations of respected persons in the community are always helpful.

Further Advice About Using Consulting Psychologists

Although this is probably a very controversial matter, it is my opinion that a consulting psychologist, upon request, should be able to furnish his client with information about the validity of the test he proposes to use. That is, if tests are going to be used, and whether there is intention of validating them in a particular organization, the client executive should be informed as to what validating has been found in comparable situations, if he is interested. If there have been no such studies, this is also important information that should be furnished upon request. In short, the validity of the instrument should not be a mystery. This subject should be discussed frankly by the client and the consulting psychologist.

Today the physician is probably not called upon to justify the validity of the instruments which he uses. The psychologist is, however, probably for two reasons. One reason may be that the psychologists have not been aggressive enough with their public relations programs — at any rate there have been numerous critical articles in popular journals as we have indicated earlier. In addition, the psychologists may not have invested sufficient time and expense in the preparation and publication of validation studies, and in other researches pertaining to problems of industrial testing.*** Such publication tends to increase professional skills, and is conspicuous evidence of interest in scientific validation.

The second reason for questioning the consulting psychologist about the validity of tests is the "quack" problem that we have mentioned. Without protective licensing laws the public may need more evidence of professional competence than the label "psychologist." Unfortunately, in most states, anyone can call himself a psychologist. This is bound to be to the disadvantage of the legitimate psychologist, and, of course, is grossly unfair to him.

In addition to furnishing the client with information about validity, it would seem wise, upon request, for the psychologist to furnish the client company with the name of the test the psychologist is planning to use. This permits independent inquiry by the client as to the utility of the particular instrument. Obviously, there is a danger here. As in the matter of furnishing information about validity, by furnishing the name of the test the psychologist runs the risk of the client company simply moving ahead on its own, thus leaving the consultant without a fee. I am not sure what the complete answer to this problem is, except that I am certain that companies have a moral obligation to not exploit the professional honesty of the psychologist. Test publishers try to prohibit unqualified users from purchasing tests, but I doubt that these controls are stringent enough.

*American Board for Psychological Services, 9827 Clayton Road, St Louis 17, Mo.

**Both are available from the American Personnel and Guidance Association, 1605 New Hampshire Ave., N.W., Washington 9, D.C.

***There are many factors that tend to discourage such publication, however. For an elaboration of these and a discussion of other problems see the author's article, "Consulting Firm Responsibility in Reporting Test Validation Studies," *American Psychologist*, March, 1960.

In addition, it should be possible to discuss with the consulting psychologist the results of any testing in a face to face situation. Mail order arrangements are less than desirable. A long distance arrangement prohibits conversation about interpretation of results and prohibits detailed knowledge of the situation in which the test is to be used. The chances of thorough development of adequate criteria and thorough validation are quite remote in a mail order situation. The psychologist should also be used from time to time to follow up on any testing program. Testing programs can deteriorate fairly rapidly without adequate supervision.

Additional Problems in the Use of Psychological Tests

We have discussed problems pertaining to the criterion, to validity and reliability, and to the qualifications of the people using tests. There are other important problems which should be mentioned, some of which will preclude the use of tests in some situations.

As we have already suggested, in any test validation research the group involved probably should include 50 people for a statistical stability. If the group or groups are smaller, the results are likely to be that much less stable.

There are certain costs which should be considered. The tests themselves are not expensive as a general rule, but equipment, space, and the salaries of those administering and interpreting tests are costs of consequence.

Employee acceptance is a problem. If testing is going to disrupt an entire work force, testing is probably not worth the trouble. Acceptance can ordinarily be gained, but this is a matter which requires considerable preparation and a history of good relationships between management and the group in question. We have already mentioned the problem of union grievances.

Then, too, there are ethical problems in the use of tests. Safeguards must be maintained so that unauthorized persons do not have access to the results of tests. In any research program, if promises are made that results will not be used to anyone's disadvantage, this agreement must be meticulously kept. Furthermore, the results of certain kinds of tests should not be given to unqualified users because of the dangers of misinterpretation.

Another problem is that managers and executives tend to be very gullible about the use of tests. As a matter of fact, there is an article entitled "The Gullibility of Personnel Managers" in which the author describes how personnel directors were found to be extremely naive about testing.[9] The chances are that personnel directors are less naive about testing than are executives in other functional areas.

A further problem has to do with the size of the group of applicants and the percentage of applicants which must be hired. For example, if there are only 80 applicants and 230 job openings, it may be necessary to employ almost all of the applicants. On the other hand, if there are 50 applicants and one job opening, there is justification for being much more selective. A test with a much lower validity coefficient can be utilized in the latter case than in a situation where only a few applicants are to be rejected.

Finally, there is the problem of test results becoming substitutes for management judgment. This problem is not restricted to psychological testing, but is a problem in the use of any managerial tool, including merit rating and job evaluation. There is always the danger that these tools will tempt the executive to allow the instrument make his decision for him. Test results should be used as only one factor in the decision-making process. That is, in connection with employment, in evaluation of employees for promotion potential, and in a counseling situation, tests results are only one dimension that should be considered.

Summary and Conclusion

Testing can be a useful tool in managerial decision-making, but the executive must be aware of the many technical, administrative, and ethical problems involved. In any testing program, there is no substitute for joint planning and cooperation by the "knowledgeable" executive and the psychologist. In some situations the industrial physician may find himself in charge of a testing program. More typically, however, he is likely to be in a position to lend his influential support to the proper use of psychological tests.

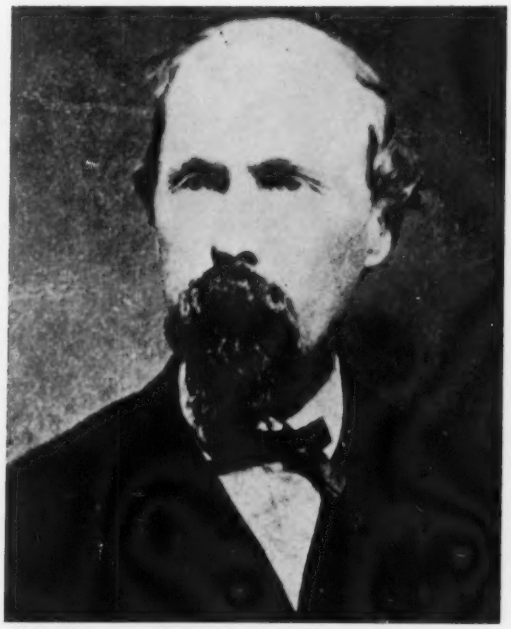
References

1. Myers, C. S.: The Pitfalls of "Mental" Tests. *Rep. Brit. Ass. Adv. Sci.* 80:808, 1911.
2. Munsterberg, H.: *Psychology and Industrial Efficiency.* Houghton Mifflin Co., New York, 1913.
3. Kelly, R.: Hiring the Worker. The Engineering Magazine Co., New York, 1919.
4. *Bulletin to Management.* Bureau of National Affairs. March 3, 1960, p. 1.
5. *Summary of Labor Arbitration Awards.* American Arbitration Assoc. Report No. 9. Dec. 15, 1959, p. 1.
6. *Labor Arbitration Reports.* Bureau of National Affairs, 33LA713.
7. Meehl, P. M.: *Clinical Versus Statistical Prediction.* Univ. of Minnesota Press, Minneapolis, 1954.
8. Gustad, J. W.: Psychology in the States. *American Psychologist* 12:341, 1957.
9. Stagner, R.: The Gullibility of Personnel Managers. *Personnel Psych.* 2:3, Autumn, 1958.

Richard D. Mudd, M.D., beside the memorial plaque honoring his grandfather, at the dedication services in Key West where he was the speaker for the Mudd family. This plaque has been placed at Fort Jefferson in the Dry Tortugas Islands. The former prison is now a national monument maintained by the National Park Service.

Adventures in Avocation

RIGHTING AN ANCIENT WRONG



Samuel A. Mudd, M.D.

On March 11, 1961, in Key West, Florida, the Dr. Samuel A. Mudd Memorial Plaque, authorized by the 86th Session of the United States Congress, was dedicated in ceremonies sponsored by the National Park Service. The plaque honors Dr. Mudd for his service, while a prisoner at Fort Jefferson, during a yellow fever epidemic that struck 270 men at the Fort and claimed many lives, including that of the post physician.

For Dr. Richard D. Mudd, Medical Director of the Chevrolet Grey Iron Foundry in Saginaw, Michigan, the journey to Key West for the memorial services honoring his grandfather was a long one, spanning many miles and many years devoted to the task of clearing his grandfather of the conviction of conspiracy in the assassination of Abraham Lincoln.

Early on the morning of April 15, 1865, John Wilkes Booth, disguised and giving the name, "Tyler," sought medical aid at the home of Dr. Samuel Mudd, 28 miles south of Washington,

D. C. His accomplice, David Herold, explained that "Tyler" had fallen from a horse. Dr. Mudd found a fractured left fibula just above the ankle, dressed the ankle and leg with splints, and allowed the pair to rest in his home. The following day, Dr. Mudd heard the news of the assassination of President Lincoln, and, having grown suspicious of his unknown visitors, reported the incident. Although it was his information that led to Booth's capture and death, Dr. Mudd was arrested as a conspirator, and jailed in Washington. A few days later, a squadron of troops thundered onto the Mudd farm, burned the fences, destroyed the crops, took the meat from the smoke house, and stationed two men at the farm with orders to shoot anyone who tried to enter the house.

The trial of Dr. Mudd, in a military court in Washington, lasted two months. The facts that Dr. Mudd and the other "Lincoln conspirators" were civilians and that the offense was allegedly committed in Maryland apparently were not considered pertinent by the Secretary of War, Edwin Stanton, who insisted that this was the proper way to deal with traitors. Dr. Mudd escaped the death penalty by one vote and was sentenced to life imprisonment in a civilian prison in New York. Secretary Stanton again intervened, and Dr. Mudd was sent instead to the Fort Jefferson Military Prison in the Dry Tortugas Islands, 70 miles west of Key West, Florida.

The occurrence of a severe yellow fever epidemic and the consequent death of the prison physician gave Dr. Mudd the opportunity, after spending two years in irons, to practice medicine again. Although he was stricken and weakened by the disease, he took charge of the hospital and the epidemic abated. In gratitude for his selfless efforts, the surviving prisoners and soldiers, to a man, signed a petition asking President Johnson to pardon Dr. Mudd. One of Johnson's last official acts accomplished this, and after four years of imprisonment, Dr. Mudd returned to an impoverished home. Thirteen years later he died of pneumonia acquired after a night call on a patient.

In his early youth, Richard Mudd was impressed by the ignominy which had descended on the family, aggravating the mortification attending the name "Mudd." He was impressed by his parents' reluctance to discuss the matter and the apparent hopelessness of the attempt to eradicate the dishonor of having a prisoner for an ancestor. Even in his teens, he collected notes on his grandfather, and in 1926 he organized a petition that led to the publication in the *Saturday Evening Post* of an article on Dr. Samuel Mudd and Fort Jefferson, George Allan England's "Tortugas Tales." Following this, a $200,000 indemnity bill was introduced in Congress, 20th Century Fox produced *The Prisoner of Shark Island* which was shown throughout the world, and through the years numerous radio and television plays about Dr. Samuel Mudd were presented.

It was a long, uphill battle for Dr. Richard Mudd. He published a book about his family, caused the republication of *The Life of Dr. Samuel A. Mudd* by Nettie Monroe, to which he added many pages, assisted numerous authors to publish books and articles on the assassination of Lincoln, and all the while built up good will among historians, editors, and reporters. Although reticent by nature, Dr. Mudd spoke before many historical associations, P.T.A. groups, legal, medical, and academic organizations, and others. Since 1946, he has averaged 24 talks a year in all parts of the United States, in all cases refusing remuneration except for travel expenses outside Michigan. He has collected every possible book on the assassination, and he has assembled a clipping and reference file consisting of tens of thousands of items that are being loaned, without charge, to students and authors all over the United States.

In 1959, Dr. Mudd persuaded his Congressman, the Honorable Alvin M. Bentley of Owosso, Michigan, to introduce a bill in Congress to declare Dr. Sam guiltless and to erect a monument to him. The bill was cosponsored by the Honorable Dante Fascell of Miami, and after the feverish activity of committee meetings, the bill passed in the House with bipartisan support. After passage in the Senate, under the sponsorship of the Honorable Phil A. Hart of Michigan, a modified version was signed by President Eisenhower that authorized the memorial plaque in honor of Dr. Sam but did not declare him innocent. Thus, Dr. Richard Mudd's hopes have not yet been fulfilled, and he continues his long journey toward righting an act of injustice, bred from a nation's grief and irrational cry for vengeance, nearly 100 years ago.

• DONALD J. CURRAN
Director, Health Education
Tinker Air Force Base, Oklahoma

Health Education at Tinker Air Force Base

Too little has been written about health education as a profession. Too few have been able, as far as this Health Educator is aware, to delve into the possibilities of this paramedical field, and to bring to public view the contributions this fertile, apparently misunderstood and neglected specialty can make to the worker, to industry, and to the community.

Much of the thinking, world-wide, on health education is narrow and outdated. True, it is good that one knows to brush his teeth, bathe frequently, follow a balanced diet and practice intelligent personal hygiene habits. It is also stimulating to know how babies get here, how to warm their bottles and how to pin a pair of pants on their pink seats. Finally, one must be prepared to be informed one day in a geriatics session about foodstuffs, hobbies, checkers and horseshoes, investments and annuities, emotional and spiritual serenity, wrinkles, stiff muscles and joints; and how, with the guiding hand of the Almighty, to live perhaps long enough to slip into a life of harmonious retirement.

How about the long industrious years between the pimples and the receipt of the engraved watch — the fruitful working years, about 40 odd, when most of us are required to scrape out a healthy and happy existence? The average individual's working years are spent, whatever the occupation, in some phase of industry.

Factory, office, and shop, "Steno" and "Exec," "Helper" and "Super;" work to be done, small job, the "big one;" hurry to slow down, money to be made, money to be spent, failure and success; long hours, lay-offs; little sleep, skip the meals or gulp 'em down; headaches and indigestion, tension and ulcers; high blood pressure, restless nights, tranquilizers, sleeping pills; occupational hazards (slippery floors to radioisotopes); personal problems, alcoholism, low morale and absenteeism; sickness, doctor bills, injury, and death: this is industry.

Into this picture place the health educator, adding only one more human being, but one who is capable and especially trained; who is not a too busy physician nor an over-worked nurse, but a counselor who devotes his time to assisting other human beings with their problems. He can be described as a "buffer" between the employee and managment and the medical department.

Permitted full access to the plant, he will be an ambassador of good will, a salesman "selling" health. He will soon be looked upon as an animated bulletin board, a hand-out with vitality, offering a personally tailored outline for each individual's own health education.

The Health Educator in Action

Tinker Air Force Base, Oklahoma, is a "city" with an adult industrial complex of about 24,000 military and civilian employees. In one building alone, under one roof, the following industrial processes are in operation daily: vapor degreasing, primarily trichloroethylene; electroplating; foundry; jet engine repair; radiation inspection; welding; plastic canopy and radome manufacture and repair; fuel cell purging; vulcanizing; sheet metal shop; decarbonizing; grinding and cleaning; magnaflux and zyglo-inspection; chemical laboratory and metallurgy.

There is one full-time industrial health educator who has found that direct health education is highly significant and of far reaching importance. The influence, by and large, of what is learned in the shops, the offices, and the Air Force Base as a whole, is frequently applied in the home, resulting in better family and community health — a "double-barrelled" result.

One personalized phase in the Tinker Air Force Base Health Education Program concerns voluntary employee health study groups that are held in the evening and that deal with particular medical subjects of general interest. The worker learns by what he sees in motion pictures and hears discussed by a guest speaker (made available through one of the Community Health Agencies) who is a specialist in a particular field of medicine.

In October, 1958, the Health Educator at Tinker Air Force Base asked the local Oklahoma State Chapter of the American Heart Association to assist in conducting an evening Heart Association Program. They were more than cooperative, and as a result, 35 practicing and research physicians volunteered to participate, without re-

The contents of this article reflect the personal views of the author and are not to be construed as a statement of official Air Force policy.

muneration, in the study groups. Two-hour sessions were held in the evening at the Base. Attendance varied from 16 to 55 employees, and included some who traveled more than 30 miles to attend the programs.

At the present time, through the assistance of the Department of Psychiatry, Neurology, and Behavioral Sciences of the Oklahoma Medical School and Medical Center, an evening Mental Health Program is being conducted. Again, no professional fees are involved. The first meeting, scheduled for 7:00 pm, was attended by 400 military and civilian employees along with their families. Judging by the comments and questions from the audience, it was definitely a success.

The second Mental Health Program was scheduled on an evening that brought rain, storm, wind, and bad driving conditions, but that also brought the volunteer speaker, a psychiatrist, as well as an audience of 150 people to the meeting.

These programs, although held in the evening, have a definite appeal and are of great interest, particularly when they convey a personal physician-patient closeness, while at the same time conveying important thoughts to the group as a whole. In other words, the average worker learns most easily his object lesson in health when it is personalized and when the information is "sugar-coated." No cold poster nor lifeless health pamphlet can be as effective. If the employee is reached, the entire community is affected by the quality of health education that has been made available.

It is possible, therefore, for industry to expect certain health practices of its employees and, through the health educator, to secure their cooperation in maintaining standards to a degree that could not otherwise be accomplished.

A monetary evaluation of a health education program or of health education is not possible. In the first place, the nature of training of any kind precludes an immediate dollars and cents value being placed on it. Too frequently its real value is found in the intangible results of variable human factors. In the second place, related and antecedent values are difficult to appraise, if they are at all susceptible to mathematical evaluation. However, let us examine the duties of one health educator.

At Tinker Air Force Base, Oklahoma, the Health Educator is attached to the Preventive Medicine Services of the 2792d USAF Hospital. He represents the Medical Director in coordinating and integrating functional activities within Preventive Medicine and all serviced areas. He assists in the planning and scheduling of all physical examinations for employees assigned to hazardous work areas. All workers who receive periodic examinations are counselled individually by the Health Educator when necessary. Each worker is given information relative to his work, his exposure, which includes physiological limits and the limits of his protective equipment. Further, he attempts to motivate the workers toward better job habits in relation to their occupational exposure.

The shops are his domain. He maintains daily contact in order that he will be acquainted with actual working conditions, the work habits of occupationally exposed persons, and conditions that might affect the morale and physical well-being of employees. Never punitive nor coercive, he must maintain the attitude of lending the helping hand of one human being to another.

At Tinker Air Force Base the Health Educator discusses absenteeism problems with the supervisors, stressing their role in the reduction of sick and injury rates. If the supervisor desires, he may schedule an employee who has a high absenteeism rate for an interview with the Health Educator. This is held in private and the employee is encouraged to speak frankly. Some problems are simply solved, others may call for medical assistance; some require a lawyer, and some the family minister. For a few, it's too late. Whether the Health Educator assists in controlling absenteeism is not for a Health Educator to say. If listening to an employee's troubles is part of the answer, then it is a start.

In bringing to a close the health educator's day, he accompanies the safety engineers and industrial hygiene engineers throughout the plant to point out health hazards. Lastly, he investigates occupational disease reports and instructs personnel in safe working procedures to prevent recurrence of disease. Control of industrial dermatitis is of primary importance in this specific duty.

His duties may have wide latitude, depending on management's acceptance and medical department cooperation. A decision always involves two elements: management and medicine — and they will have to decide if health education is a paying proposition.

Management in itself is a big business. Medical personnel are routinely too busy in their professional duties to worry with or carry out a continuously directed health education program. If such a program may result in an activated mental and physical health consciousness that enlivens morale, improves health, elevates efficiency, reduces absenteeism, and accelerates production schedules it's worth a try. Health education, if given a chance, will work. Health educators do exist, and they can make a distinct contribution to industry, to the worker, to the community.

Books

How To Lick Executive Stress and Stay in Top Emotional and Physical Trim

Robert Collier Page, $25.00. Pages not numbered. Prentice-Hall, Inc., Englewood Cliffs, N. J., 1961.

This book is addressed to the industrial executive and chiefly the high executive, "You, the president." Dr. Page approaches the executive on the latter's own mental premises, using the language of that executive. The tempo is staccato and never is a word wasted. At one point in the publisher's description of the author, he is mentioned as "a medical management lecturer." It may be surmised that this book is based upon a series of live and lively appearances before assemblies of executives, with no time for the leisurely. These 11 lectures, if such they be, have provided these captions: "Two Mythical Monsters: Overwork and Periodic Slump," "How to Make Every Day an On Day," "How to Change Executive Stress From Enemy to Friend," "How to Build and Maintain a Perpetual Supply of Reserve Energy," "Obesity: A New Common-Sense Approach to Executive Diet," "Alcohol: False Friend or Valuable Servant," "How to Make the Most of Your Doctor and of Modern Medicine," "How to Keep Your Family on the Team," "Anxiety in High Places," "Successful Antidotes for Your Anxieties," "The Whole Man Concept."

The author, possibly, is at his best when he devotes himself to the topic of alcohol drinking which he does in fully detached manner. He provides dicta as to when and when not to drink:

When To Drink:

Drink with people who respond pleasantly to alcohol.

Be sure you are physically healthy and in good frame of mind.

Have your first drink only after all of your daily obligations have been discharged.

Be ready to eat a full meal after three or four drinks, and don't plan to resume drinking after eating.

When Not To Drink:

Never drink when you are unhappy, depressed, irritable, or anxious.

Avoid alcohol when you are suffering from physical aches, or other discomforts.

Do not drink with people whom you dislike actively or who tend to make you angry.

Do not drink if you are going to have to exercise your brain or physical skill.

If these injunctions were observed in rigorous fashion, every bar in the country would close its doors and every cocktail party would be a flop. Who can say, who can tell, maybe that is one of the desiderata.

Appropriately at the end the author furnishes his own summary of his book's import:

> "Analyze your five basic roles in life: the romantic role, the recreational or sportsman's role, the 'good friend' role, the 'good citizen' role, and the role of the connoisseur of good things.
>
> By finding out your aptitudes for peak performance in each of these roles, and by perfecting yourself in accordance with your individual ability, you will find that the majority of your anxiety-stress problems solve themselves. You become a 24-hour-a-day leader. Stress becomes your best friend and anxiety becomes a weak, easily-beaten adversary. You find you are able to tackle everything with enthusiasm, drawing on a bottomless reserve supply of energy. You are wholly at ease and brim full of self-confidence because you know, to the utmost, what you can do, and nobody can pressure you into doing what you cannot do.
>
> In short, you are a Whole Man: you are in harmony with your world.

Long it has been said that the nontechnical writings in the world of occupational health lack luster, color, drama, showmanship, and machine gun tempo. If those be the effective attributes, then this book is the grand exception. It possesses all those qualities in teeming measure.

The Physician in Industry

William P. Shepard. $9.50. Pp. 290. McGraw-Hill Book Company, Inc., New York, 1961.

The author of this book is a gifted medical writer. His forte is the capacity to reduce the technicalities and canonicals of medicine to the understandable, but in language attended by sprightful dignity. This quality is displayed in the opening paragraphs of the text as quoted:

> The primary purpose of this book is to help the practicing physician interested in industrial medicine to orient himself in a new environment. It is by no means a complete textbook on industrial medicine. Rather, it is intended to place at the disposal of those interested in this field a brief, readable, simple summary of what is expected of physicians by industry in this country today.
>
> Medical practice in industry, as elsewhere, is dedicated to the best possible care of the patient. The only differences are environment and the limiting conditions

inherent in all industry, especially in smaller companies. Neither medical school training nor hospital experience fully prepare us for these differences; yet our success in industrial medicine hinges upon understanding them. The benefits of good medicine, including preventive medicine, must be made available, without delay, to the greatly increased number of people engaged in industry if we are to fulfill their expectations and if we are to take our proper place in planning these services. Unless we do these two things, and soon, medicine is in danger of becoming merely a "hired hand" of management or unions, or both.

The position of this author in American medicine is unique. He long has been the liaison between occupational health and the general practice of medicine; between occupational health and public health, although occupational health itself is essentially preventive medicine; between public health and the general practice of medicine. Foremostly this book is an interpretation of occupational health for the general practitioner who has discovered occupational health or wants to discover it. To that end Dr. Shepard has written engagingly on such topics as, The Role of the Physician in Industry; Preplacement and Periodic Physical Examinations; The Working Environment; Industrial Toxicology; Radiation Hazards in Industry; The Industrial Dispensary; Accidents and their Prevention; Medical Aspect of Workmen's Compensation; Medical Care for Disabled Industrial Workers; Absenteeism; Health Education in Industry; The Nurse in Small Industry; Mental Health in Industry; Desirable Qualifications for the Part-time Industrial Physician.

This book does not bristle with the techniques, the methodologies and the intricacies, inescapably a part of occupational health. Instead it bubbles in consonance with the meaning of occupational health to the medical profession, to industry, to industrial workers, to public health, and to the community.

Precis de Toxicologie

René Fabre and René Truhaut. Price not given. Volume 1, Pp. 311; Volume 2, Pp. 400. Société d-édition d'enseignement Supérieur, Paris, 1960.

The authors have written a précis of some 700 pages in two volumes on toxicology which was especially intended for students in pharmacy and in medicine. The authors recognize that it is in a treatise only that a complete documentation can be found by all those interested in certain aspects of toxicology.

This précis gives in a condensed form information on the etiology of the intoxications for each poison discussed, their physical and chemical properties, their rapid detection in the air whenever feasible, their quantitative determination, their symptoms and treatment, and on the collective and individual prophylactic measures to be taken.

The authors state that their précis provides in many cases more information than necessary for the student. This supplementary information deals with the symptomatology, the treatment, the anatomopathological lesions, the individual and collective prophylactic measures, the mode of action of the various toxic substances, and the legislation on the control of occupational diseases.

Some chapters give generalities on intoxication, toxicity, the modes of penetration in the body, the metabolization of the principal toxic substances and on the various types of intoxication according to their mode of occurrence (criminal, suicidal, accidental). The accidental ones are subdivided in medicinal, occupational, and alimentary. There is also another chapter which deals with the various types of antidotes.

The technical texture of this précis, that is, its description and discussion of the various methods of investigation to detect and control the hazards related to the various toxic substances are well presented. The authors give an excellent exposé of certain modern methods of analysis together with a certain number of chemical reactions of minor importance. They describe and discuss the classic methods of analysis which depend generally upon wet chemistry; not much emphasis has been placed on physical methods of analysis.

Much valuable information can be found in these volumes by the student, and we would have liked the authors to point out more clearly those methods of analysis that are the most practical ones. A brief classification of such methods would, in our opinion, have helped the reader to assimilate more readily the large amount of valuable information contained in this précis.

The fact that this précis contains basic information on the symptomatology, the physiological effects, the treatment, the metabolization, the various modes of penetration of toxic substances in the body, the various types of antidotes, air analysis, on the chronic effects and on the individual and collective prophylactic measures for a number of toxic substances encountered in industry makes it also an excellent book of reference for the industrial physician and for the professors who are dispensing elementary teaching in the prevention of occupational diseases.

—J. P. PARE, M.Sc.

—F. J. TOURANGEAU, M.D., D.P.H., F.A.M.I.A.

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The Plight of Cuban Physician Refugees

Some 1,100 Cuban physicians have fled their native land because of persecutions. The majority is in this country and chiefly in Florida. These physicians have lost everything — their possessions, their incomes, their practices, their churches, and sometimes their families. It is a badge of honor for any physician to have been forced out of Cuba. Tyrants always seek to eliminate the intelligent. The riff-raff readily succumb to the machinations of the oppressor. Perhaps the only charge that might be leveled at these physicians is that they are men and women of patriotism, affluence, influence, and integrity.

How many of these physician refugees are industrial physicians is not fully known. It is known that Dr. Rafael Peñalver is within that number and perhaps is the sole outstanding industrial physician in the total. In a just sense, Dr. Peñalver may be regarded as the youthful dean of occupational medicine as that specialty formerly existed in what now is but the Cuban debacle. In Havana, his base of operations, Dr. Peñalver long has been accepted as an outstanding clinician. His notable occupational disease work has been as an investigator of manganese poisoning, an occupational disease all too frequent among the miners of Cuba. His total vita of training, experience, connections, and publications is impressive.

A listing of a few of his activities in the field of occupational health in Cuba will give an indication of his qualifications:

Director, Department of Occupational Diseases and Accidents, Nuestra Señora del Pilar Hospital (average of 300 new cases per month)

Founder and Director of Medical Department of Autobusses Modernos (bus company) that operates 800 buses in Havana with 5000 employees

Founder and Director of Medical Department of Firestone Tire & Rubber Company of Cuba

Founder and Director, Medical Department, Habana Hilton Hotel

Instructor, Legal Medicine and Toxicology, University of Habana School of Medicine

Founder, and currently Vice President, Cuban Industrial Medical Association

Fellow, District Counselor, of the Industrial Medical Association

Member of the International Permanent Committee on Industrial Medicine.

In the United States, Dr. Peñalver is better known in occupational health circles than many of this country's native sons in that specialty of medicine. He has appeared on numerous scientific programs and has written both for North and South American medical journals. In addition to his native Spanish, Dr. Peñalver speaks and writes English as well as some members of the "First Families of Virginia."

Dr. Peñalver may not be regarded as a prototype of the Cuban physician refugees. His singular qualifications mark him as outstanding. So soon as his honorable misfortunes become known it may be assured that more than one of this country's corporations operating on a major scale in Spanish speaking countries promptly will command his occupational medical attainments. Dr. Peñalver will stand as distinguished in any country.

Dr. Peñalver's friends may reach him by mail at 4200 N.W. 12 Avenue, Miami, Florida, but in these parlous times in the lives of all Cuban refugees, there are uncertainties. This being true, any mail addressed to Dr. Peñalver in care of this Journal faithfully will be delivered wherever he may be in his struggles to cope with a harrowing lot of misadventures, not of his own making.

Starch Granuloma

Some 15 or 20 years ago it was firmly established that the talc applied to the surgeon's gloves was a primary source of adhesions within the body cavities after operative procedures. This was readily understood and explained by industrial toxicologists and hygienists because of the well-known proliferative properties of siliceous materials. It was freely granted on all sides the talc should be kept apart from surgical activities.

At once substitutes were sought and, among others, starch became widely acceptable as a surgical glove powder. Radke and some of his surgical associates at the University of Washington now provide evidence that starch is not the innocent agent that it was expected to be, and that starch has proved to be the source of granuloma. In *Northwest Medicine*, March, 1961, they note in part:

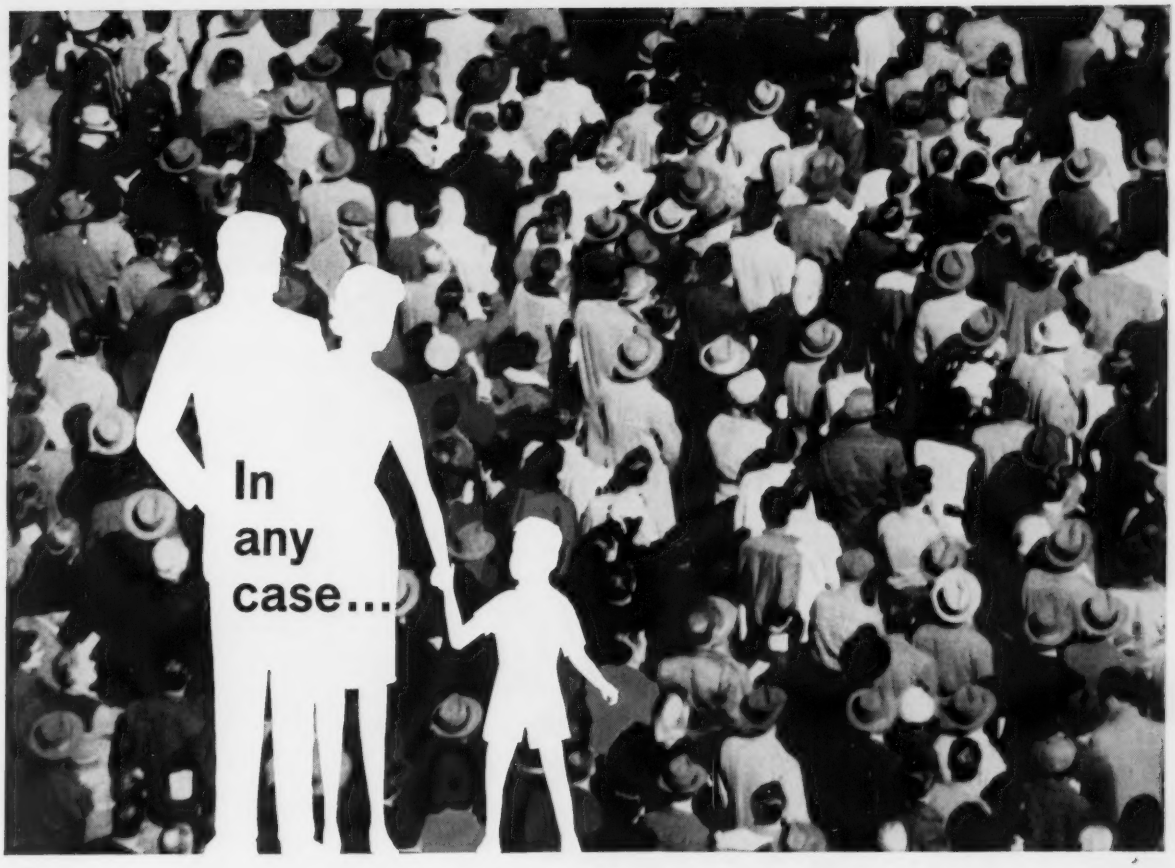
"Since starch has been developed as a surgical glove lubricant vastly superior to talc, and is in widespread everyday use, an exaggerated confidence in its safety exists. The purpose of this paper is to emphasize that a granulomatous inflammatory reaction with the serious sequelae of peritonitis and intestinal obstruction, may result from the introduction of starch into the peritoneal cavity.

"Talc was discarded about 10 years ago because of the foreign body reaction which it incites when seeded in an open wound. In 1947 Lee and Lehman found that massive dense adhesions are produced when dry talcum is dusted over the serosal surfaces of the peritonium in dogs. Talc has been generally replaced as a surgical glove lubricant, by a powder derived from corn starch. It is absorbed and metabolized when introduced into animal tissue. The starch has been treated by a tanning process so as to resist autoclave breakdown and contains the additive MnO_2, as a dispersal agent."

The case reported represents an example in which peritoneal seeding of granules of starch glove lubricant is believed to be a significant etiologic factor in production of peritoneal granulomata.

"This case is felt to represent a foreign body reaction by the peritoneum to a starch derivative powder. Gross and microscopic examination of this reaction produce findings similar to those reported in the comprehensive study in animals by Lee, Collins and Largen. Their conclusions emphasize that, although treated starch powder is biologically absorbable, it is a foreign body, and produces a foreign body reaction as long as it is present; usually three weeks in normal animals. Lehman states that the intensity, duration, and reversibility of any foreign body reaction is influenced by multiple variables which include: bacterial contamination or inflammation or both; particle size; physiochemical and antigenic characteristics of the foreign body; and host-tissue type responses governed by factors such as the presence of malignancy, infection and the site of the wound. Lee states that the adhesions produced by starch powder appear to be the result of 'clumping' in which these larger deposits cannot be absorbed as rapidly as can individual granules, and the longer the delay in absorption the greater the likelihood that the foreign body reaction will be irreversible and its resultant adhesions permanent."

And so passes in much likelihood another promising substitute for talc in the surgical amphitheater. If starch be unwanted just as talc certainly is unwanted, in time the perfect substitute will appear and all will be well.



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- lowers motility
- **controls diarrhea**

Lomotil brings prompt symptomatic control in diarrhea, either acute or chronic.

Both pharmacologic and clinical evidence indicate that Lomotil selectively lowers the propulsive component of gastrointestinal motility without relaxing intestinal sphincters. So efficient is this action that studies in mice have shown Lomotil to be effectively antidiarrheal in one-eleventh the dosage of morphine.

Such striking antidiarrheal activity strongly suggests that Lomotil is the drug of *first* choice for prompt and positive control of diarrhea.

Dosage: The recommended initial dosage for adults is two tablets (2.5 mg. each) three or four times daily, reduced to meet the requirements of each patient as soon as the diarrhea is under control. Maintenance dosage may be as low as two tablets daily. Lomotil is supplied as unscored, uncoated white tablets of 2.5 mg., each containing 0.025 mg. of atropine sulfate to discourage deliberate overdosage. Recommended dosage schedules should not be exceeded.

An exempt preparation under Federal Narcotic Law.

Descriptive literature and directions for use available in Physicians' Product Brochure No. 81 from G. D. Searle & Co., P.O. Box 5110, Chicago 80, Illinois.

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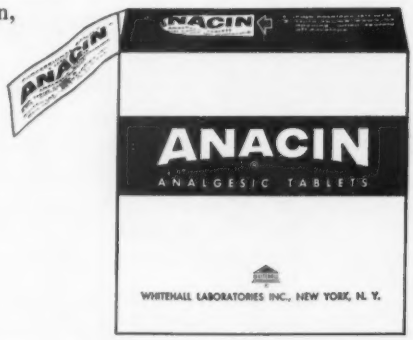
The value of an analgesic depends upon its ability to raise the pain threshold, reduce pain, change the mood, produce a sedative action, avoid side effects and exert a *better total effect* upon the patient[1]. Anacin® adequately fulfills these requirements...

Anacin promptly raises the pain threshold with no untoward side effects or gastric upsets. A component in Anacin (acetophenetidin) allays nervous tension, anxiety and leaves the patient more relaxed. In this way, Anacin affords a *better total effect* than does aspirin or any buffered aspirin. Why not consider the advantages of Anacin for your patients?



Reference: 1. Hardy, James D.: The Nature of Pain: J. of Chronic Diseases, Vol. 4, July 1956.

WHITEHALL LABORATORIES, NEW YORK, N. Y.

COMMENT AND OPINION

AMA To Study Radiation Injury

With more and more nuclear reactors coming into use all over the nation, many practicing physicians soon may begin to face the problem of treating injuries from radiation accidents.

A section of internationally known experts in the treatment for radiation injuries will offer three major papers in this important new area of medical care at the 15th annual clinical meeting of the American Medical Association to be held Nov. 26 to 30 in Denver. Chairman will be Marshall Brucer, M.D., Chairman of the Medical Division, Oak Ridge Institute of Nuclear Studies, Oak Ridge, Tenn.

The radiation experts will discuss such topics as "Potential and Probable Sources of Radiation Accidents," "Diagnosis and Pathology of Radiation Injury," and "Treatment and Prognosis of Radiation Injury." Participants will include researchers from Los Alamos and Oak Ridge, the Office of the Surgeon General, and the University of Chicago.

An outstanding scientific program, with emphasis on new research developments, has been planned under the direction of Samuel P. Newman, M.D., Denver, Chairman of the AMA's Council on Scientific Assembly. The meeting will also include sessions and papers on such important areas of medicine as genes and chromosomes, electronics and computers in medicine, space medicine, medical aspects of American habits, new developments in virology, new findings in chemotherapy for cancer and latest data in the field of antibodies and antigens.

The Cost of Safety

The true significance of health and safety factors has been given only passing recognition in the international race for low cost nuclear power. This is the principal conclusion of a three year study covered in a new book, *Nuclear Power Safety Economics* published by Pilot Books, an analysis of health and safety costs associated with the design, construction, and operation of nuclear power reactors.

Author Saul J. Harris, former physicist at Brookhaven National Laboratory and staff executive of the Atomic Industrial Forum, declares, "Reactor designers have been unwilling to admit the impact and high percentage of total costs attributable to safety considerations." The author, chairman of the committee that drafted the first comprehensive state code requiring control of industrial radiation hazards, indicates that the portion of construction costs linked to safety may range as high as 65%.

In addition, the report declares that "Failure to give health and safety factors their proper emphasis in discussions of insurance, site selection, regulatory aspects, and public acceptance of nuclear hazards could prolong indefinitely the arrival of truly competitive nuclear power."

To assess clearly safety factors, "An industrial group should construct and run several prototypes to destruction, obtaining full biological, physical, and radiation data . . . to prove if broad assumptions as to the effects of a maximum credible accident are realistic."

Influenza Is Coming

Dr. Luther L. Terry, Surgeon General of the Public Health Service, has reported that an upswing in the influenza cycle is likely to hit this country during the fall and winter.

He recommended immediate vaccinations for persons in the three groups which accounted for most of the 86,000 flu-triggered deaths between September, 1957, and March, 1960. These groups are: Persons with heart disease, pulmonary disease, diabetes and other chronic illnesses; persons over 65; and pregnant women.

"We are probably due for some Asian flu outbreaks, since they come in 2 to 3 year cycles, and we are overdue for Type B flu outbreaks which come in 4 to 6 year cycles," Dr. Terry said. "Asian flu has been dormant here since March, 1960, and it has been more than six years since we had much Type B flu in this country."

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POSITIONS WANTED

Medical Director: Bd elig, int med; Cert, Occ Med; 5 yrs phy-in-charge, lge plant, import co; 3 yrs med dir heavy indus w/5000 employees; seeks 75% adm 25% cl med; any loc.
Medical Director: Dipl, Prev med; Cert, Occ med; Doctor of Indus Med, Univ of Cincinnati; 10 yrs, indus med, seeks post w/challenge, Calif, NY, Wash, New Engl.
Medical Director: Dipl, Prev & Occ med; Ph. D., Indus med; 1 yr chief phy import chem co; 4 yrs, dir indus hygiene, import organ; 5 yrs dir both med dept & dept of safety, lge indus firm; seeks dirshp w/greater scope.
Medical Director: MPH, Harvard; Elig, Occ med; extensive experience as med dir, very impor co, heavy indus; and chief, PH lge foreign countries; returng 2 yrs impor indus post abroad; outstandg man w/impressive record of achievment; seeks indus or PH as chief, warmer climates; highly recommd.
Medical Director: Dipl, Prev med; post grad work cardio & electro, occ med, leadg schls; 20 yrs exp indus med, firm operatns transferring to S, wishes remain in E.
Medical Director: Dipl, Prev med; Cert, Occ med; MPH; 38; 2 yrs plant phy, leadg co; 5 yrs plant phy, lge pharm co; seeks med dir, lge co or plant chief phy; any loc.
Medical Director: Cert Prev med in Occ med; 10 yrs exper occ dis consultant, labor board; 4 yrs plant med dir leadg eastern firm; (F) AAOM, (F) ACPM, (F) IMA; seeks challenge.
Medical Director: Bd elig, prev med; 5 yrs Med dir Mid-E firm, 4 yrs med dir leadg manufactrg co; seeks post w/greater oppor practice prev med; any loc, pref vic city.
Staff: Completng formal trng, import schl PH; Bd elig, Occ med; 33; pref SE coast.
Staff: 32; mil serv compltd; exc prev med & 3 yrs priv pract exper; seeks post w/growth potentl; well trnd yng man.
Staff: 35; mil serv compltd; 4 yrs plant phy & 2 yrs med dir, lge regionl plant, leadg indus; seeks post w/future; pref MW.
Staff: 31; 3 yrs indus exper; now completg tour of duty, USAF; outstandg yng man.

POSITIONS OPEN

Medical Director: Leading co; reqs Ped w/ excel trng; analyze med trends & wk w/Vice pres in connectn w/new med products, 25% travel; $15-$18,000; excel benefits, Mid-W.
Medical Director: Bd internist to head lge occ med prog; lge co seeks to develop prog meriting nat'l reputation; unlimited managmnt cooperation; exc sal; Chgo area.
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Head Department: Lrg med treatmnt centr leadg Alaskan firm; reqs surg or int med w/PH; good money, travel and maintnce provided for single man; oppor advancemnt soon.
Staff: Lge company; dept approved for occ med credit, American boards; if some expet about $18,000; great oppor career; Pac-NW.
Staff: With int med residency completed & inter in career post; lge diagnostic dept $15,000; oppor rapid advancemnt; East.
Assistant Medical Director: Branch plant, lge indus, 500 employees; exc sal and oppor future advancemnt short time; E.
Staff: Space age project lge firm; reqs 2 yrs exper priv pract or military serv; exc oppor yng man; fine future potentl; E.
Head Department: 24 man specialty grp; own 200-bd hsp; lge city on Ohio River; good starting sal, increases ea 6 months to partnership in 1½ years; fine oppor.
Associate: W/indus MD, very busy private pract of small plant occ med; $15-$16,000 1st yr; %; town 37,000; oppor develp; Mid-E.

IF IN NEED OF MEDICAL PERSONNEL OR WISH TO RELOCATE, PLEASE WRITE US SO WE MAY PREPARE AN INDIVIDUAL SURVEY FOR YOU

Both types of flu were prevalent in other countries in the 1960-61 flu season, notably in England where flu was the direct cause of more than 1,000 deaths and the indirect cause of several more thousands. In 1951, when England had a similar epidemic, it reached this country the following year, Dr. Terry noted.

The Public Health Service is alerting physicians and health officers, and the Bureau of Public Assistance, another unit of the Department of Health, Education, and Welfare, is urging state welfare agencies to include flu immunizations in medical care provided under public assistance programs.

Recommendations on use of flu vaccine, including a detailed listing of the chronic conditions most likely to be complicated by influenza, are being furnished to private physicians and health officers. They were prepared by the Surgeon General's Advisory Committee on Influenza, following a meeting at the Service's Communicable Disease Center in Atlanta, on July 31. At that meeting, committee members agreed unanimously on the likelihood of outbreaks this winter and on the need for a special effort to immunize high risk groups in advance.

Fire Hazards of Ammonium Nitrate

An extensive research program into the fire hazards of ammonium nitrate and related materials will be undertaken by the Bureau of Mines, United States Department of Interior, under a cooperative agreement with the Manufacturing Chemists' Association, Inc.

The research project is expected to begin soon and will run for one year, with the entire cost of $60,000 borne by the Association. The agreement provides for an extension beyond the one year period if necessary. The research will cover not only the fire hazards of ammonium nitrate, but of such related systems as nitric acid-hydrocarbon, ammonium nitrate-urea, and combinations of these systems.

The Bureau will study the effect of contaminants, and of confinement on the detonability of solid and molten ammonium nitrate and evaluate its sensitivity to initiation by the close proximity detonation of other explosive systems, such as may have been present during a train derailment, fire, and explosion Dec. 17, 1960, near Traskwood, Ark.

Although an attempt will be made to establish the relative probability of causes of the Traskwood incident, a longer range goal will be to define more precisely the various conditions under which ammonium nitrate may be stored and transported safely.

Shortly after the Traskwood accident, the Association took the leadership in

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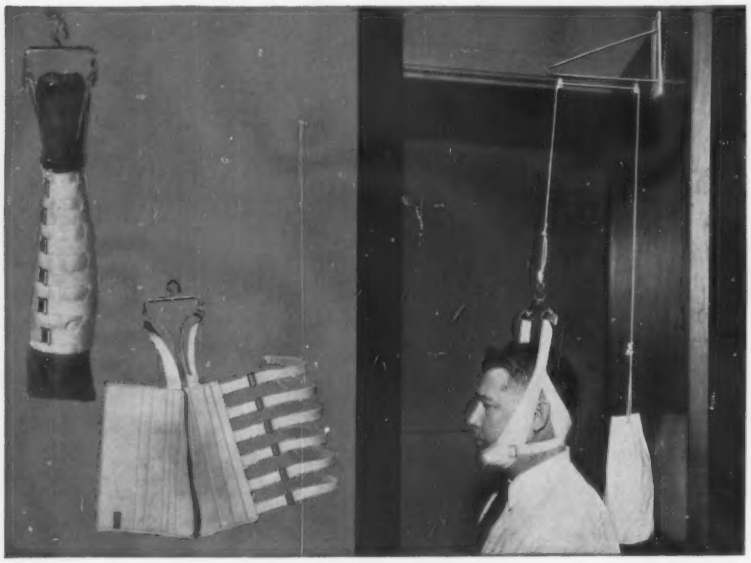
for positive therapy, comfortable use in hospital or home



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Available in complete set or individual units

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■ enhanced anti-inflammatory, antiallergic, antipruritic effects ■ far less gastrointestinal distress ■ may be of value when other corticoids have failed ■ virtually **no** mood changes, edema, sodium or water retention, or secondary hypertension

Supply: Scored tablets of 1 mg., 2 mg. and 4 mg. Syrup, in 120 cc. bottles, each 5 cc. teaspoonful containing 5.1 mg. triamcinolone diacetate providing 4 mg. triamcinolone.

*Glaser, J.: Ann. Allergy 18:510 (May) 1960.

For full information, see your Squibb Product Reference or Product Brief.

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Asthma

an effort to determine what actually occurred and to insure, as far as possible, that a similar explosion would not happen again. Although several investigations were made, results were inconclusive due to the number of products involved and the Association felt an independent agency, such as the Bureau of Mines, should undertake a more comprehensive study of some of the factors involved.

The interests of the Bureau and the Association are parallel because the Bureau performs research and tests on potentially hazardous materials and is interested in obtaining data on ammonium nitrate and related systems, and the Association has been actively interested in safety procedures in the handling, storage, and transportation of ammonium nitrate since 1947. The Association's Ammonium Nitrate Technical Committee was established in November, 1949.

The Bureau's investigation will be carried out under the direction of Dr. Robert W. Van Dolah, Chief, Explosives Research Laboratory, Pittsburgh, Pa. Dr. W. G. McKenna of New York City, representing the Bureau of Explosives of the Association of American Railroads, will serve as a consultant.

Radiation Monitoring System for John Hancock

Tracerlab, Inc. will furnish the John Hancock Mutual Life Insurance Company with a radiation monitoring system to be incorporated into its comprehensive Civil Defense program. The system is to be used for the protection of some 6,000 occupants of the Home Office building in Boston in the event of nuclear attack. Area monitors will measure the levels of radiation in those locations where John Hancock employees are to gather in case of man-made or natural disaster.

Tracerlab, pioneer in the field of radiation monitoring, has developed for John Hancock a unique system to survey the internal as well as the immediate surrounding effects of a nuclear disaster before anyone would be permitted to leave the designated shelter areas. The most important feature of this system is that it allows the management of the Company, along with those responsible for the proper functioning of the program, to be fully cognizant of the levels of radiation at all times. The system is the only one of its kind used for Civil Defense purposes which enables a group to have complete knowledge of radiation levels in the areas designated for protective shelter purposes. The proper functioning of this program does not rely upon battery power but on the usual emergency electrical power facilities.

The John Hancock Civil Defense program, when completed, will provide for total self-reliance within the Home Office Building and will include all facilities essential to basic survival—food, shelter, water, medical care, sanitation, power generation, ventilation, air filtering, communications, and security.

Insurance Extended in New York

Over 500,000 workers in New York State, previously not quali-

Biological Testing[1] Proves

the Virtual Absence of Toxicity in go-jo creme hand cleaner

PHASE I: Groups of Swiss mice received daily injections of Go-Jo Creme Hand Cleaner.[2] After seven days, body weights were recorded and the animals of one group sacrificed for gross pathology. The remaining animals received injections for three weeks and then were sacrificed and autopsied. The absence of mortality, weight loss, change in organ weights and gross pathology evidenced Go-Jo Creme Hand Cleaner's virtual freedom from systemic toxicity.

PHASE II: Albino rabbits were grouped and their flanks shaved. The experimental group was further divided, and the skin of one subgroup was abraded. For two weeks the subjects received daily applications of Go-Jo Creme Hand Cleaner. After a thirty-day observation period the animals were sacrificed and autopsied for gross pathology. Specimens of control and treated skin underwent histological examination for the appearance of pathological changes. The virtual absence of gross and microscopic pathology following prolonged topical application evidenced Go-Jo Creme Hand Cleaner's relative freedom from dermal toxicity.

The tests confirmed the virtual absence of subacute or chronic dermal or systemic toxicity and established the relative safety and freedom from toxic irritants of Go-Jo Creme Hand Cleaner.

1. Methods recommended by The Association of Food and Drug Officials of the United States for the appraisal of the safety of chemicals in foods, drugs and cosmetics.

2. Cans of Go-Jo Creme Hand Cleaner were obtained from retail supplies and pooled. This pooled sample was used in all tests.

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"Triamcinolone has been shown to have more profound anti-inflammatory and antiallergic properties than preceding corticosteroids."*

■ enhanced anti-inflammatory, antipruritic, antiallergic effects ■ less gastrointestinal distress ■ may be of value when other corticoids have failed ■ virtually **no** mood changes, edema, sodium or water retention, or secondary hypertension

Supply: Scored tablets of 1 mg., 2 mg. and 4 mg. Syrup in 120 cc. bottles, each 5 cc. teaspoonful containing 5.1 mg. triamcinolone diacetate providing 4 mg. triamcinolone.

*Edelstein, A. J.: Pennsylvania M. J. 62:1831 (Dec.) 1959.

For full information, see your Squibb Product Reference or Product Brief.

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fied for protection, will have compensation and disability coverage beginning January 1, 1962, it was announced by Col. S. E. Senior, Chairman of the Workmen's Compensation Board. "As a result of amendments to laws over the past three years," he said, "New York State will have finally achieved virtually full coverage for its labor force."

The Chairman announced that all employers in the state, with very few exceptions, will be required to insure their employees beginning the first of 1962, regardless of the number of employees they may have. The law previously required employers of two or more to carry insurance coverage, but exempted employers of only one person in nonhazardous occupations.

Workers Live Longer

The average length of life of the millions of industrial policyholders of the Metropolitan Life Insurance Company reached a new high of 70.5 years in 1960, according to company statisticians.

While the 1960 longevity of American wage earners is only slightly higher than in recent years, it is impressive when considered over longer periods. For instance, five years have been added to the expectation of life of these policyholders since 1946, 10 years since 1937, and 24 years since 1909. Compared with the period 1879-94, the earliest for which data are available, the 1960 record of longevity is more than twice as great.

The average length of life for these wage-earners and their families is now somewhat above that of the general population of the United States. "In 1909," the statisticians report, "the expectation of life at birth of the industrial policyholders was about six years less than that of the population as a whole. By mid-century the two groups were on a par; at present, the industrial policyholders have a slight advantage."

The Mentally Retarded Worker

Mentally retarded persons achieve a much greater degree of out-of-school success than is commonly realized, and many of them manage to function as workers without benefit of special training. This and other findings are presented in a section on "The Mentally Retarded" in the July-August issue of *Rehabilitation Record*. The magazine is the official publication of the Office of Vocational Rehabilitation.

Earning capacity and social adjustment of the retarded are analyzed in several articles. One, reviewing results of a project conducted by Goodwill Industries of Greater Kansas City (Missouri), notes that 62 "last hope" clients who were placed in jobs by Goodwill earned $64,558.91 and paid $3,704.80 in withholding taxes during the first two years of the project. The need for attacking problems of the more severely retarded by combining resources of vocational rehabilitation services, public schools, and sheltered workshops is stressed in another contribution. How professional research and training needs and the social and vocational rehabilitation needs of retarded students are served simultaneously at New Jersey's Edward

A COMPACT REFERENCE LIBRARY FOR THE INDUSTRIAL PHYSICIAN

A MANUAL OF NEUROLOGY AND PSYCHIATRY IN OCCUPATIONAL MEDICINE
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An immediately useful working manual to aid the occupational physician in recognizing and dealing with neurologic and psychiatric problems frequently encountered in daily industrial practice. Time-saving reference columns of questions, causes, symptoms, tests, diagnosis and techniques for further care and treatment.

236 pages **$6.75**

NOISE AND YOUR EAR by Aram Glorig, M.D.

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"The volume presents an orientation to alcoholism as a disease including definition, etiology, and a general discussion of complications, diagnosis, prognosis and treatment . . . a must have." —U. S. Armed Forces J.

"It is one of the best monographs available on the subject." —N. Y. State J. Med.

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A compact monograph that covers the occupational diseases of the lungs resulting from inhalation of dust.

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R. Johnstone Research and Training Center is described in an article by the Center's superintendent and three staff members.

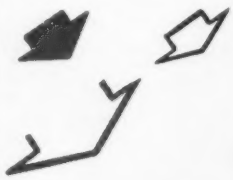
Electric Behavior

The number of patients admitted to hospitals for psychiatric disturbances is related to an increase in the number and intensity of electrical storms. Dr. Robert O. Becker, Assistant Professor of Surgery at the State University of New York Upstate Medical Center and Chief of the Orthopedic Section, Veterans Administration Hospital in Syracuse, told scientists attending the second annual Bionics Symposium on the Cornell University campus (Aug. 30 to Sept. 1) that his preliminary research indicates an electrical charge in human beings may affect their mental health and general well-being.

Dr. Becker said our behavior may be influenced more than we realize by environmental factors which we cannot see, hear or smell — the magnetic fields around us and our electrical interaction with them.

The phenomena of sleep, hypnosis, response to force fields, and cyclic patterns of behavior cannot be adequately explained on the basis of present knowledge of nerve system function, Dr. Becker said. The action potential of the nerve is now considered to be the way in which the nerve works. This action potential is basically a traveling wave in the nerve fiber membrane, and is not the actual transmission of electrical charges along the nerve fiber.

Dr. Becker's paper presented new evidence for the existence of a second type of nerve activity that is more primitive than the action potential system.



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HYDRODIURIL® WITH MEPROBAMATE
HYDROCHLOROTHIAZIDE

to relieve the symptoms of premenstrual tension

for EDEMA... **CYCLEX provides the prompt diuresis of HYDRODIURIL for rapid reduction of weight gain, breast fullness, abdominal congestion**

for MOOD-CHANGES... **CYCLEX supplies the effective relief of meprobamate for nervousness, irritability, tension, nausea, malaise, insomnia**

for GI DISTRESS... **CYCLEX affords quick-acting relief of nausea and bloating associated with premenstrual tension**

SUPPLIED: **Tablets, bottles of 100. Each tablet contains 25 mg. of HYDRODIURIL (hydrochlorothiazide) and 200 mg. of meprobamate.**

DOSAGE: **Usual adult dosage is one tablet once or twice a day, beginning on the first morning of symptoms and continuing until the onset of menses. CYCLEX may be continued through the menstrual period.**

Before prescribing or administering CYCLEX, the physician should consult detailed information on use accompanying package or available on request.

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MSD

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It has been discovered, he said, that all nerve cells are electrically polarized and that there is a constant electrical current flowing within the nerve and its fibers. This current is thought to be produced by the flow of electrons moving within the molecular structure of the nerve in the same fashion as within transistors or other similar solid-state devices. Changes in the amount of current or the polarization potential change the way in which the nerve fiber functions. For example, dropping the current to zero or reversing the polarization produces a state of inactivity in the nerve fiber.

This system of direct currents flowing within the nervous system has been found to be closely related to sleep, anesthesia and hypnosis in the human. Preliminary studies also show a difference between the direct current system of normal humans and that of the mentally ill. Some relationship has been shown in animals between growth and healing processes and the direct current system.

Dr. Becker said preliminary research shows the electrical charge in humans varies in a 24 hour period and a longer period of about 28 days. The mentally ill person shows the same pattern, but with greatly exaggerated variations and in an opposite direction. This cyclical variation is similar to such cycles in nature as that of the mussel — that opens and closes with the tides even when not near the shore — and may have applications to the adjustment of astronauts to space travel, when the biological clock will be affected.

Research shows that the electrical charge of a person's body changes drastically when he is under hypnosis or anesthesia. The Soviet Union, Dr. Becker said, is already using this principle for anesthesia in surgery. Any injury or abnormality affects the normal pattern of charges.

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Exit Safely

A new edition of the Building Exits Code, just published by the National Fire Protection Association, includes many new features of life safety from fire. Developed by the NFPA Committee on Safety to Life, it was adopted by the Association at its recent annual meeting in Detroit.

The Building Exits Code concerns itself wholly with safeguarding life from fire and panic, and deals not only with exits but many related features such as fire drills, exit lighting, signs and similar subjects. The National Fire Protection Association has no record of loss of life by panic or by trapping in a burning building in any case where the requirements of the Building Exits Code were met. The Building Exits Code is purely advisory as far as the National Fire Protection Association is concerned, but is widely used as a basis of law and legal regulation in the interest of public safety.

Copies of the new edition (NFPA No. 101, 256 pages, $1.50) are available from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

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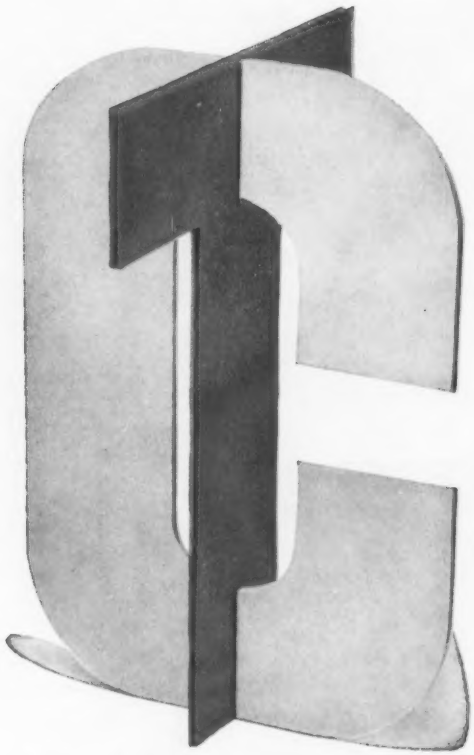

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of dependable performance,
exceptional tolerance

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TOPICAL OINTMENT
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BRAND OF OXYTETRACYCLINE HCl AND HYDROCORTISONE

Uniting the individually established effectiveness and exceptional tissue tolerance of TERRAMYCIN® and CORTRIL® (hydrocortisone)...for rapid symptomatic relief and resolution of lesions in skin, eye, and ear inflammation and infection.

IN BRIEF

TERRA-CORTRIL Topical Ointment and Eye/Ear Suspension unite the potent anti-inflammatory action of hydrocortisone (Cortril®) with the broad-spectrum anti-infective control of oxytetracycline (Terramycin®), for anti-infective, anti-allergic, and anti-inflammatory action in topical therapy. Unusually well tolerated, TERRA-CORTRIL makes possible the successful treatment of a wider range of dermatologic, ocular, and otic conditions with a single medication.

Indications: Topical Ointment – prevents or combats inflammation and infections in pyodermas, allergic and contact dermatoses, wounds, minor burns, and other inflammatory skin conditions with superimposed infections. Eye/Ear Suspension – prevents or combats inflammations of the external eye and ear and of the anterior ocular segment due to allergy, trauma, or infection due to TERRAMYCIN-sensitive organisms.

Supplemental oral antibacterial therapy is advisable in the treatment of severe infections or those which may become systemic.

Administration and Dosage: Topical Ointment – After thorough cleansing of affected skin areas, a small amount of ointment should be applied gently. Repeat up to four times daily. When actual infection is present, apply on sterile gauze for continuous contact with affected area.

Eye/Ear Suspension – *Ocular Conditions:* 1 or 2 drops into the affected eye three times daily. *Otic Conditions:* In external ear canal disorders, 2 to 4 drops three times daily, or as required. Keep dropper out of contact with infected area. In eye/ear infections that are deep-seated or spreading, systemic therapy should be employed concurrently.

Side Effects: Few instances of hypersensitivity to topically applied hydrocortisone have been reported. Allergic reactions to TERRAMYCIN are infrequent. TERRA-CORTRIL Topical Ointment or Eye/Ear Suspension should be discontinued if such reactions occur and are severe.

Precautions and Contraindications: Broad-spectrum antibiotics may cause overgrowth of nonsusceptible organisms, e.g., monilia, resistant staphylococci. If this occurs, discontinue the medication and take appropriate countermeasures. Topical Ointment: Allergic reactions to oxytetracycline are rarely encountered. With the possible exception of herpes simplex and second-degree burns, there are few dermatologic contraindications to topical use of hydrocortisone. Eye/Ear Suspension: There is considerable evidence that corticosteroids may be contraindicated both topically and systemically in certain infectious conditions of the cornea – particularly herpetic infections (dendritic keratitis, superficial punctate keratitis) and epidemic keratoconjunctivitis.

Supplied: Topical Ointment – In 1/6-oz. (5.0 Gm.) and 1/2-oz. (14.2 Gm.) tubes, containing 3% oxytetracycline (Terramycin®) hydrochloride and 1% hydrocortisone (Cortril®) alcohol in each gram of petrolatum base.

Eye/Ear Suspension – In 5 cc. amber bottles with sterile dropper. Each cc. of TERRA-CORTRIL Eye/Ear Suspension contains 5 mg. of oxytetracycline HCl (Terramycin®) and 15 mg. of hydrocortisone (Cortril®) acetate in a gel-like base of controlled viscosity.

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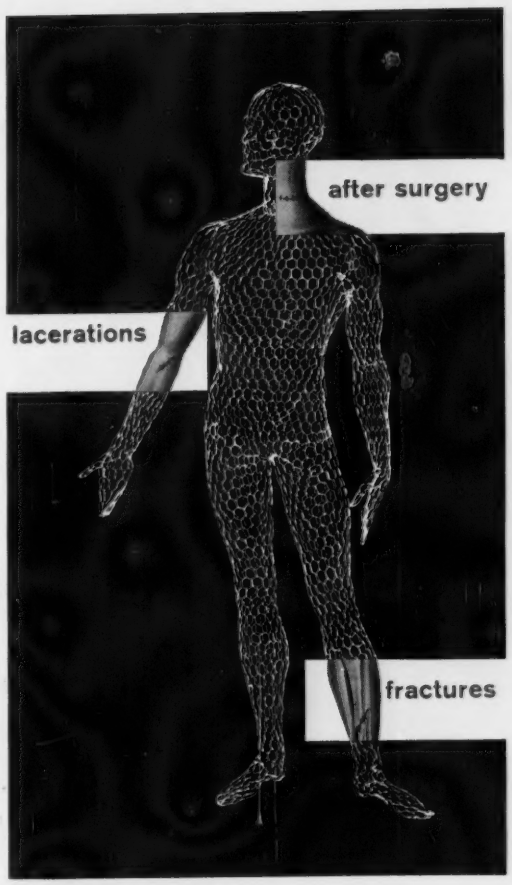

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Parenzyme is compatible with all commonly used drugs, including antibiotics. In infection, appropriate antibiotic therapy should be used concurrently.

For complete details on indications, dosage, administration and side effects, see insert included with each package.

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References: 1. Carpenter, E. B.: Southern M.J. 51:627, 1958. 2. Forsyth, H. F.: J.A.M.A. 167:163, 1958. 3. Grisolia, A., and Thomson, J. E. M.: Clin. Orthopaedics 13:299, 1959. 4. Levanten, E. O., and Vaccarino, F. P.: Current Therap. Res. 2:497, 1960. 5. Lewis, W. B.: California Med. 90:26, 1959. 6. O'Doherty, D. S., and Shields, C. D.: J.A.M.A. 167:160, 1958. 7. Park, H. W.: J.A.M.A. 167:168, 1958. 8. Plumb, C. S.: Journal-Lancet 78:531, 1958. 9. Poppen, J. L., and Flanagan, M. E.: J.A.M.A. 171:298, 1959. 10. Schaubel, H. J.: Orthopedics 1:274, 1959.

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